U.S. Army Center for Health Promotion and Preventive Medicine

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TRAINING MUNITIONS HEALTH RISK
ASSESSMENT
NO. 39-EJ-1485-00
RESIDENTIAL EXPOSURE FROM INHALATION OF
AIR EMISSIONS FROM THE
M1A1 .50 CALIBER BLANK CARTRIDGE

Prepared by:

DEPARTMENT OF DEFENSE IDENTIFICATION CODE: A559

Environmental Health Risk Assessment Program

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Prepared for:

U.S. Army Environmental Center

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Published date:

15 June 2001

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Approved for public release; distribution unlimited

20011218 138

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Readiness Thru Health

U.S. Army Center for Health Promotion and Preventive Medicine

The lineage of the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) can be traced back over 50 years. This organization began as the U.S. Army Industrial Hygiene Laboratory, established during the industrial buildup for World War II, under the direct supervision of the Army Surgeon General. Its original location was at the Johns Hopkins School of Hygiene and Public Health. Its mission was to conduct occupational health surveys and investigations within the Department of Defense's (DOD's) industrial production base. It was staffed with three personnel and had a limited annual operating budget of three thousand dollars.

Most recently, it became internationally known as the U.S. Army Environmental Hygiene Agency (AEHA). Its mission expanded to support worldwide preventive medicine programs of the Army, DOD, and other Federal agencies as directed by the Army Medical Command or the Office of The Surgeon General, through consultations, support services, investigations, on-site visits, and training.

On 1 August 1994, AEHA was redesignated the U.S. Army Center for Health Promotion and Preventive Medicine with a provisional status and a commanding general officer. On 1 October 1995, the nonprovisional status was approved with a mission of providing preventive medicine and health promotion leadership, direction, and services for America's Army.

The organization's quest has always been one of excellence and the provision of quality service. Today, its goal is to be an established world-class center of excellence for achieving and maintaining a fit, healthy, and ready force. To achieve that end, the CHPPM holds firmly to its values which are steeped in rich military heritage:

- **★** Integrity is the foundation
 - ★ Excellence is the standard
 - ★ Customer satisfaction is the focus
 - ★ Its people are the most valued resource
 - ★ Continuous quality improvement is the pathway

This organization stands on the threshold of even greater challenges and responsibilities. It has been reorganized and reengineered to support the Army of the future. The CHPPM now has three direct support activities located in Fort Meade, Maryland; Fort McPherson, Georgia; and Fitzsimons Army Medical Center, Aurora, Colorado; to provide responsive regional health promotion and preventive medicine support across the U.S. There are also two CHPPM overseas commands in Landstuhl, Germany and Camp Zama, Japan who contribute to the success of CHPPM's increasing global mission. As CHPPM moves into the 21st Century, new programs relating to fitness, health promotion, wellness, and disease surveillance are being added. As always, CHPPM stands firm in its commitment to Army readiness. It is an organization proud of its fine history, yet equally excited about its challenging future.

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection

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DEPARTMENT OF THE ARMY U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE 5158 BLACKHAWK ROAD ABERDEEN PROVING GROUND, MARYLAND 21010-5422

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TRAINING MUNITIONS HEALTH RISK ASSESSMENT NO. 39-EJ-1485-00 RESIDENTIAL EXPOSURE FROM INHALATION OF AIR EMISSIONS FROM THE M1A1 .50 CALIBER BLANK CARTRIDGE

EXECUTIVE SUMMARY

This assessment evaluated the potential for human health effects to offsite residents breathing air emissions following use of the M1A1 .50 Caliber Blank Cartridge (M1A1) on firing ranges during training exercises.

To conduct this assessment, air emissions from the M1A1 were collected in a test chamber at the U.S. Army Aberdeen Test Center, Maryland. The data collected from the Firing Point Emission Study provided the amount and types of substances released from the M1A1. This information was then used in an air dispersion model to determine ambient air concentrations at locations downwind from the M1A1 firing location. Since the training facility in this assessment is hypothetical, the air model used assumptions that provided conservative estimates of air concentrations.

Modeled air concentrations were combined with exposure information (e.g., number of cartridges used per year) to estimate the amount of each substance the hypothetical resident breathes. This estimate was then compared with the substance's health-based screening level, which was obtained from agencies such as the U.S. Environmental Protection Agency, to determine if there is a potential for health effects from inhalation of these substances.

The health risk assessment included both long-term (30 years) and short-term (15-minute or 1-hour) exposures to modeled substance concentrations. Assessment results, generated using conservative methods, showed that the hypothetical offsite resident breathing air as close as 200 meters (656 feet) from the M1A1 firing location is safe from these emissions. At locations where offsite residents are located less than 200 meters from the M1A1 firing locations, a more site-specific evaluation is necessary. It should be noted that at most training installations, training areas are over 1,000 meters (over half a mile) away from populated areas.

Readiness thru Health

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LIST OF ACRONYMS

AEC U.S. Army Environmental Center

AEGL Acute Exposure Guideline Levels

AIHA American Industrial Hygiene Association

Al Aluminum

ATC U.S. Army Aberdeen Test Center

ATSDR Agency for Toxic Substances and Disease Registry

ATV Acute Toxicity Value

CO₂ Carbon Dioxide

DODIC Department of Defense Identification Code

DOE U.S. Department of Energy

EPA U.S. Environmental Protection Agency

ERPG Emergency Response Planning Guidelines

HBSL Health-Based Screening Level

INPUFF Integrated PUFF Model

NAAQS National Ambient Air Quality Standards

NEW Net Explosive Weight

OEL Occupational Exposure Limit

PM₁₀ Particulate Matter under 10 microns in size

PRG Preliminary Remediation Goals

RBC Risk-Based Concentration

RfC Reference Concentration

TEEL Temporary Emergency Exposure Limits

TPH Total Petroleum Hydrocarbons

TSP Total Suspended Particulates

USACHPPM U.S. Army Center for Health Promotion and Preventive Medicine

TRAINING MUNITIONS HEALTH RISK ASSESSMENT NO. 39-EJ-1485-00 RESIDENTIAL EXPOSURE FROM INHALATION OF AIR EMISSIONS FROM THE M1A1 .50 CALIBER BLANK CARTRIDGE

1. PURPOSE

This document presents the assessment of the potential for human health effects to offsite residents breathing air emissions following use of the M1A1 .50 Caliber Blank Cartridge (M1A1) on firing ranges during training exercises.

2. AUTHORITY

Memorandum, U.S. Army Environmental Center, 4 June 1999, Subject: Pyrotechnics Risk Assessment.

3. REFERENCES

See Appendix A for a list of references.

4. BACKGROUND

4.1 CARTRIDGES AND THEIR USF

Cartridges are cases that contain a primer, propelling charge, and projectile. The primer is needed to activate the propelling charge, which provides the force to send the projectile to a target. Examples of projectiles include bullets, rockets, and missiles. Cartridges are also referred to as "rounds" and are fired from weapons such as pistols or rifles.

4.2 WHAT IS THE M1A1?

The M1A1 is a blank cartridge used in training exercises. It can be identified by the rosette crimp at the mouth and absence of a bullet (Reference 1). Each cartridge is about the length of a soda can.

The M1A1 is a blank cartridge consisting of a brass cartridge case. It also contains a propelling charge that is made up mostly of nitrocellulose and nitroglycerine. Nitrocellulose is commonly used in the production of lacquers and artificial leathers. Nitroglycerine is a component in dynamite and is used for military and industrial purposes, such as mining and demolition.

4.3 USE OF THE M1A1

The M1A1 is used to simulate firing in training exercises. It is fired from .50 caliber machine guns. A device is attached to the gun to allow for firing with blank

ammunition (Reference 1). Firing with blank ammunition allows soldiers to safely simulate combat and practice using weapons.

4.4 ASSESSMENT SUMMARY

The general assessment approach consisted of two main parts: air dispersion modeling and exposure assessment, which are briefly discussed in the paragraphs below. Sections 5 through 7 present a discussion of the methodology used for this assessment.

Emissions data used in the air dispersion modeling was obtained from the Firing Point Emission Study, conducted by the U.S. Army Aberdeen Test Center (ATC), at Aberdeen Proving Ground, Maryland (Reference 2). This study was funded by the U.S. Army Environmental Center (AEC) with the purpose of identifying and quantifying emissions from weapons firing. Data from this study was generated by firing munitions with weapons that are representative of those used by the U.S. Army during training operations. Emissions data for the M1A1 was generated by firing the it from the M2 machine gun.

The emissions data for the M1A1 was used with an atmospheric dispersion model to estimate the average concentrations that may be experienced by an offsite resident. Since this assessment is designed to provide results that would be applicable to most Army training facilities, the training area used in this assessment was a hypothetical one. While most training areas are at least 1,000 meters away from populated areas, as a conservative distance, it was initially assumed that a person could reside 100 meters downwind from the firing point (location where the machine gun is positioned). In addition, air-modeling parameters were selected to mimic worst-case conditions.

The exposure assessment included calculations of time-averaged concentrations for both long-term (chronic) and short-term (acute) exposures. For the purpose of this assessment, air concentrations were averaged over 30 years for chronic exposures and 1-hour or 15 minutes for acute exposures. Using a screening approach, a substance's estimated time-averaged air concentration was then compared to chronic health-based screening levels (HBSLs) established by the U.S. Environmental Protection Agency (EPA) or acute toxicity values (ATVs) established by selected agencies depending on the exposure duration (i.e., 30 years versus 1-hour or 15 minutes). The comparison was made using the ratio of the HBSL or ATV to estimated air concentration for each of the substances evaluated. If this ratio was less than one, no further evaluation was needed. This approach is conservative because the exposure assumptions used by the agencies, to establish HBSLs and ATVs, are likely to overestimate the exposures experienced by offsite residents living near firing ranges. If the chronic or acute averaged concentrations (C_{chronic} and C_{acute}) were greater than these screening levels, further analysis would be warranted to determine the potential for health effects. Note that concentrations greater than the screening levels do not indicate an onset of health effects, but rather the potential for such.

5. DATA COLLECTION AND AIR MODELING

5.1 EMISSION FACTORS

Emission factors, used to derive the air modeling emission rates used in this assessment, were generated from the Firing Point Emission Study conducted by the ATC (Reference 2). This study identified and quantified air emissions from the firing of the M1A1 from the M2 machine gun. The data provided by the ATC included the net explosive weight (NEW) of the M1A1, the substances sampled, and substance-specific emission factors. Emissions data from the Firing Point Emission Study are included in the first four columns of the table located in Appendix B.

5.2 BACKGROUND AND DESCRIPTION

Air dispersion models are available to mathematically simulate plume behavior and to estimate downwind concentrations of substances emitted from various sources. However, specific models are not available to determine the dispersion of emissions from munitions used during training. Estimating the magnitude and location of these concentrations depends on many factors including the amount and type of emissions, the behavior of the source, and meteorological conditions. Since a specific model is not available for modeling the use of munitions during training, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) evaluated numerous air models to determine which would be suitable for use with munitions used during training. The USACHPPM recommended using the Integrated PUFF (INPUFF) model to estimate the dispersion of emissions from various munitions sources (Reference 3).

The INPUFF Model (Reference 4) was developed to simulate dispersion from instantaneous or semi-continuous point sources. This Gaussian-integrated puff model is capable of addressing a cloud type release over short periods of time, and computations can be performed for a single point source for multiple receptors. The algorithms used to calculate concentrations assume a vertically uniform wind direction (with no chemical reaction) to compute the contribution of each cloud at a receptor for each time step/interval.

5.3 MODEL ASSUMPTIONS

Some assumptions were made to best represent the firing of the M1A1 cartridges. These assumptions were as follows:

Typically, with conventional point sources (such as incinerators), the cloud rise and formation are determined by characterizing flue gas exit velocity, temperature, and stack diameter. The M1A1 cartridges are used in conjunction with machine guns. For unconventional sources with no real physical stack dimensions, such as machine guns, the stack height and diameter were assumed to be equal to the height of the barrel and the bore diameter. No exit velocity was used with this source because the emission rated generated from the test data were obtained from sampling a stabilized

cloud with no exit velocity. Table 1 includes the source parameters used to model the M1A1 cartridges.

TABLE 1: SOURCE PARAMETERS

Parameter	Model Input
Source/Stack Diameter	0.01 meters
Source/Stack Height	1 meter
Source Exit Temperature	298.15 degrees Kelvin (°K) (or 77 °F)
Exit Velocity	0 meters/second
Initial horizontal dispersion coefficient (σ_y)	0.87 meters
Initial vertical dispersion coefficient (σ_z)	1.07 meters

- Initial cloud dimensions are preferred to model the air emissions from these types of releases. Typically, these dimensions are used to define the initial horizontal and vertical dispersion values (σ_y and σ_z) of the released cloud. However, this information was not measured during the studies at the ATC; therefore, the cloud dimensions were based on the test chamber dimensions and the volume of air sampled. By assuming an elliptical cloud with the prevailing wind direction being perpendicular to the muzzle when fired, the test chamber's radius would be equal to the initial vertical dispersion (σ_z), and the initial horizontal dispersion (σ_y), would be equal to one half the length of the test chamber. The cloud exit temperature was assumed to be equal to the test chamber temperature.
- For the purposes of this assessment, a hypothetical offsite resident was assumed to be located first at 100 meters, then at 200 meters directly downwind from the source. The meander of the cloud is a major factor when estimating concentrations at given locations downwind from the source. Assuming that the resident is directly downwind from the source is the same as assuming that there is no cloud meander and the center of the cloud migrates directly over the hypothetical offsite resident. This assumption provides the most conservative modeled concentrations.
- Since this assessment does not look at a specific training site, generic, worst-case meteorological data were used. To determine the worst-case meteorological conditions that would result in the highest air emission concentrations, the modeling was performed using the EPA Risk Management Program Guidance (Reference 5). This guidance includes tables for estimating the footprint of chemical releases and is intended to inform emergency responders of potential accidental releases. The EPA has defined most default conditions for meteorological modeling parameters. Table 2 lists the meteorological parameters that were used in the air model.

TABLE 2: WORST-CASE METEOROLOGICAL PARAMETERS

Parameter	Input Value
Wind Speed	1 meter/second
Atmospheric Stability	Category F
Wind Direction	270°
Ambient Temperature	293 degrees Kelvin (°K) (or 68 °F)

5.4 GENERAL METHODOLOGY

The model was run for a total calculation time of 200 seconds for the 100-meter location and 300 seconds for the 200-meter location. This was done to simulate a single round being fired and to ensure that the total mass of the cloud had passed the hypothetical resident locations. Concentrations were calculated every 2 or 3 seconds, depending on the location being modeled. The model results indicated that the initial cloud reached the hypothetical offsite resident at 200 meters within 154 seconds and dissipated below the lowest concentration the model calculated, which in this instance $(1 \times 10^{-12} \, \text{g/m}^3)$ occurred within 275 seconds. Table 3 contains the air model input parameters used in this assessment.

TABLE 3: AIR MODEL INPUT PARAMETERS

Parameter	Input	Value
i didineter	100 meters	200 meters
Number of meteorological periods (NTIME)	1	1
Duration of each meteorological period (ITIME)	200 seconds	300 seconds
Number of updates to the source (NSRCDS)	100	100
Duration/time step between each source update (ISUPDT)	2 seconds	3 seconds
Total time modeled/Simulation Period (NTIME) (ITIME)= (NSRCDS) (ISUPDT)	200 seconds	300 seconds

5.5 USE OF MODEL OUTPUT

The concentrations provided by the INPUFF model were based on a unit emission rate (ER_{unit}) of 1 gram/second from an emission source, and did not represent any substance-specific concentrations from the use of any weapons system. This unit emission rate is typically used for ease of modeling purposes. The relationship between the emission rate and predicted concentration is linear. Therefore, the ratio of the predicted concentration to the unit emission rate was multiplied by each substance-specific emission rate to provide substance-specific concentrations.

5.6 DETERMINATION OF SUBSTANCE-SPECIFIC EMISSION RATES

The actual substance emission rate for one item (ER_1) for each substance was calculated using Equation 1. Example 1 contains a sample calculation using this equation.

$$ER_1 = \frac{EF \cdot CV}{t}$$
 Equation 1

Where:

 ER_1 = emission rate for one item ((g/item)/sec)

EF = average adjusted emission factor (lb/item)

CV = conversion factor (453.59 g/lb)

t = release duration obtained from the INPUFF model (sec)

Example 1 Sample Calculation Using Equation 1:

$$ER_1 = \frac{(2.11E-03)(453.59)}{(3)}$$

= 3.191 E-01 g/sec

Calculation provided for Carbon Dioxide (CO₂) at the 200-meter location. Appendix B provides the average adjusted emission factor of CO₂ in lb/item.

Substance-specific ambient concentrations for one item (CONC) were calculated using Equation 2. A sample calculation using this equation is provided in Example 2. Appendix B contains the estimated air concentrations for both the 100 and 200-meter locations.

$$CONC = ER_1 \cdot \frac{UC}{ER_{unit}}$$

Equation 2

Where:

CONC = substance concentration based on one item (g/m³)

 ER_1 = emission rate for one item (g/sec)

ER_{unit} = unit emission rate as used in the model (g/sec)

UC = concentration based on the unit emission rate (g/m³)

Example 2 Sample Calculation Using Equation 2:

$$CONC = (3.191E - 01) \frac{(6.870E - 05)}{(1)}$$

 $= 2.192E-05 g/m^3$

Calculation provided for CO₂ at the 200-meter location.

6. RISK ASSESSMENT

6.1 EXPOSURE ASSUMPTIONS

Exposure assumptions were selected using a typical use scenario for the M1A1 during training exercises. The typical use scenario was provided by the AEC and is based on consultation with their senior training advisor (References 6, 7). The frequency of use for the M1A1 was required to determine how much substance an offsite resident would be exposed to in the time period of interest (i.e., acute or chronic exposure). Table 4 summarizes the general use scenario for the M1A1.

TABLE 4: FREQUENCY OF USE FOR THE M1A1

Parameter	Value Used
Number of cartridges used per year	123,600
Maximum number of cartridges used in one hour	3,000

6.2 TIME-AVERAGING

For the chronic assessment, time-averaged concentrations were calculated by assuming that the hypothetical resident would be exposed for 30 years. This is consistent with the exposure duration used by the EPA, which assumes that the resident spends 30 years at the same residence. By using the same exposure duration, the estimated time-averaged concentrations could be compared with their respective HBSLs, which are derived using standard EPA default assumptions.

Using the default residence time established by the EPA, the assumption was made that someone could be exposed to air emissions from 123,600 cartridges per year for 30 years. Table 5 lists the exposure parameters used to estimate concentrations for the chronic assessment. These parameters are based on the typical use scenario provided by the AEC (Table 4) and the assumptions used in the air model run.

TABLE 5: EXPOSURE PARAMETERS USED TO DETERMINE TIME-AVERAGED CHRONIC AIR CONCENTRATIONS

Exposure Parameter	Value	Used
Exposure i arameter	100 meters	200 meters
Exposure Time (ET _{ctg})	3.333 min/cartridge ¹	5 min/cartridge ¹
Exposure Frequency (EF _{ctg})	123,600 ca	rtridges/year
Exposure Duration (ED)		ears ²
¹ Based on the total model time of 200 seconds (3.33 minutes) of model run. ² EPA default value.	or 300 seconds (5 minu	utes) used in the air

Chronic averaged concentrations were calculated using Equation 3. Example 3 shows how this calculation was performed using the total suspended particulates (TSP) concentration at 200 meters as an example. Since TSP is classified as a noncarcinogen, the averaging time (AT) is the same as the exposure duration.

$$C_{chronic} = \frac{CONC \cdot 10^6 \cdot ET_{ctg} \cdot EF_{ctg} \cdot ED}{525,600 \cdot AT}$$
 Equation 3

Where:

 $C_{chronic}$ = average chronic concentration (µg/m³)

CONC = average modeled concentration for one cartridge (g/m³)

 10^6 = unit conversion (µg/g)

 ET_{ctg} = exposure time per cartridge (minutes/cartridge)

 EF_{ctg} = exposure frequency (cartridges/year)

ED = exposure duration (years)

525,600 = unit conversion (minutes/year)

AT = averaging time (years)

(carcinogenic endpoint: AT = 70 years noncarcinogenic endpoint: AT = ED)

Example 3 Sample Calculation Using Equation 3:

$$C_{chronic(TSP)} = \frac{(9.615E - 07)(10^6)(5)(123,600)(30)}{(525,600)(30)}$$

 $= 1.13E+00 \mu g/m^3$

Appendix B provides the average modeled concentration for one cartridge (CONC). Table 5 includes the exposure parameters.

Unlike the chronic assessment, only limited guidance for evaluating acute exposures is currently available. Since many cartridges may be fired in a short period of time, however, acute exposures cannot be overlooked. For the purpose of this assessment, acute exposure is defined as a 1-hour or 15-minute exposure. The 1-hour or 15-minute acute exposure averaging times allow for comparison with guidelines developed specifically for emergency planning purposes (see discussion on acute toxicity below).

The exposure frequency is based on the number of cartridges used per 1-hour or 15 minutes depending on the guideline used for comparison. This information is based on the use scenario provided in Table 4. To estimate air concentrations for potential acute health effects, it was conservatively assumed that 3,000 M1A1s are fired in one hour. The average acute concentrations were computed using Equation 4. Example 4 contains a sample calculation at 200 meters using this equation. Since TSP does not have an ATV, aluminum (AI) is used as the example substance.

$$C_{acute} = \frac{CONC \cdot 10^6 \cdot ET_{ctg} \cdot EF_{ctg}}{60}$$
 Equation 4

Where:

C_{acute} = average acute concentration (μg/m³)

CONC = average modeled concentration for one cartridge (g/m³)

 10^6 = unit conversion (µg/g)

ET_{ctg} = exposure time per cartridge (minutes/cartridge)

EF_{ctg} = exposure frequency (cartridges/hour)*

60 = unit conversion (minutes/hour)

^{*} Based on 1-hour or 15 minute (0.25 hour) ATV

Example 4 Sample Calculation Using Equation 4:

$$C_{acute(Al)} = \frac{(2.016E - 08)(10^6)(5)(3,000 / 0.25)}{60}$$
$$= 2.02E + 01 \,\mu\text{g/m}^3$$

Appendix B provides the average modeled concentration for one cartridge (CONC) for Al.

6.3 TOXICITY ASSESSMENT

The potential for health effects was determined by comparing time-averaged air concentrations to HBSLs, which are developed from a substance's known toxicity. These toxicity values typically include different levels of safety factors depending on the level of confidence of the critical study. Appendix C contains a table of screening toxicity values used for the chronic and acute assessments.

6.3.1 CHRONIC ASSESSMENT

The chronic assessment was conducted using a screening approach. Using this method, a substance's estimated time-averaged air concentration was compared to its HBSL. If this ratio was less than one, no further analysis was required. This approach is conservative because the exposure assumptions used by the EPA, to establish HBSLs, assume that the resident is continuously exposed for 350 days per year (assuming 2 weeks vacation per year). In contrast, exposure to air emissions from actual training activities at a firing range is intermittent and is not likely to occur on a daily basis year round.

A hierarchy of sources was developed for selection of the HBSLs to quantitatively evaluate as many of the identified substances as possible. The hierarchy of sources used was as follows:

- Clean Air Act, EPA National Ambient Air Quality Standards (NAAQS) (Reference 10)
- > EPA Region 9 Preliminary Remediation Goals (PRGs) (Reference 9)
- ➤ EPA Region 3 Risk-Based Concentrations (RBCs) (Reference 8)

Some substances have neither PRGs nor RBCs because they have their own set of regulatory standards. Under the Clean Air Act, the EPA is required to establish NAAQS for several substances considered harmful to public health and the environment. Currently, NAAQS are available for seven substances. The NAAQS for the longer averaging time were used for the chronic assessment. Depending on the substance, this can range from an 8-hour average to an annual average. In addition,

since the majority of the measured TSP was PM_{10} (particulate matter under 10 microns in size) (Reference 3), the NAAQS for PM_{10} was used to evaluate the potential for health effects from exposure to TSP.

Next on the hierarchy, after the NAAQS, are the EPA Region 9 PRGs and the EPA Region 3 RBCs. Since the methodology used by EPA Region 9 to develop the PRGs generally results in lower values than the EPA Region 3 RBCs, the PRGs were first on the hierarchy of sources. RBCs were used when a PRG was not available. To ensure that the most recent information was used, the Internet sites of both EPA Regions were checked. The HBSLs used for this assessment are presented in Appendix C.

Although the general approach used by both EPA Region 3 and Region 9 is the same, the exposure assumptions differ enough so that final recommended values can vary to a certain degree. In both methods, a substance's screening concentration was selected using the toxicity endpoint that derives a lower concentration. For example, if a substance has a known systemic toxicity and is a carcinogen, the screening concentration was calculated using both toxicity values. To maintain a conservative approach, EPA then selected the lower screening concentration as the recommended PRG or RBC.

Example 5 shows a sample calculation of how a substance's estimated chronic concentration was compared to its HBSL using the TSP concentration at 200 meters as an example.

Example 5

Sample Calculation Comparing a Substance's Estimated Chronic Concentration to Its HBSL:

$$\frac{C_{chronic(TSP)}}{HBSL} = \frac{1.13E + 00}{5.00E + 01}$$
$$= 2.26E - 02 < 1$$

In this case, the resulting ratio is less than one, indicating further evaluation is not necessary.

Many petroleum hydrocarbons were detected but do not have specific screening levels. Therefore, the approach recommended by the Total Petroleum Hydrocarbon Criteria Working Group (Reference 11) was adopted to evaluate petroleum hydrocarbon mixtures. Based on the working group's assessment of various hydrocarbons, it was recommended that mixtures be separated according to a

substance's number of carbons and its chemical class (i.e., aliphatic or aromatic¹). Generally, as a substance's carbon number increases, its molecular weight increases, and it is, therefore, not a substance of concern via inhalation. The working group also concluded that aromatic hydrocarbons tend to be more toxic than aliphatic hydrocarbons (Reference 11). Table 6 tabulates the inhalation toxicity values used to evaluate exposure to petroleum mixtures. To be consistent with the methodology used in this assessment, the reference concentrations (RfCs) were converted to PRGs using Region 9 exposure assumptions. The resulting PRGs were used as the HBSLs for the petroleum hydrocarbons in this assessment. These values are presented in Appendix D.

TABLE 6: SUMMARY OF RfCs USED FOR PETROLEUM HYDROCARBONS1

Carbon Range	Aromatic Inhalation RfC (mg/m³)	Aliphatic Inhalation RfC (mg/m³)
C ₅ – C ₆ C _{>6} – C ₈		18.4
C>7 - C8	0.4	7
$C_{>8} - C_{10}$ $C_{>10} - C_{12}$ $C_{>12} - C_{16}$	0.2	1.0
$C_{>16} - C_{21}$ $C_{>21} - C_{35}$	NA	NA

Reference 12

NA = not applicable for high molecular weight TPHs (Total Petroleum Hydrocarbons) ($C_{>16}$) because substances in this carbon range are not volatile and therefore, inhalation is not a pathway of concern.

6.3.2 ACUTE ASSESSMENT

An established method for assessing acute health effects is not currently available. In 1995 the EPA recognized the need for acute exposure guidelines for emergency response purposes and created the National Advisory Committee for Acute Exposure Guideline Levels (AEGLs) for Hazardous Substances. Currently, AEGLs are available for only a few substances.

To overcome the absence of acute toxicity data, several state regulatory agencies have suggested that guidelines developed for emergency purposes be used in the interim. Although suggestions have been made to use occupational exposure limits (OELs) by applying additional safety factors (References 13, 14), OELs were not used in this assessment because they introduce even more uncertainty than the use of emergency guidelines. The OELs are designed to protect the workplace environment,

¹ Aliphatic hydrocarbons are hydrocarbons in which the carbon atoms are joined by single covalent bonds consisting of two shared electrons (e.g., butane). Aromatic hydrocarbons have ring structures (e.g., benzene) (Reference 12).

and assume 8 hours a day, 5 days a week exposures. By definition, these exposures are more chronic than acute.

In comparison, emergency planning guidelines are more appropriate because they are typically developed for exposures of 1-hour or less. In addition, safety factors are included as part of the guideline development so that the values would be protective of the general population.

Emergency Response Planning Guidelines (ERPGs) published by the American Industrial Hygiene Association (AIHA) (Reference 15) and the Temporary Emergency Exposure Limits (TEELs) developed by the U.S. Department of Energy (DOE) (Reference 16) were used for this assessment, specifically the ERPG-1s and the TEEL-1s. Since TEEL-1s are intended for exposures up to 15-minutes, air concentrations compared to TEELs were averaged over a 15-minute period. Air concentrations compared to ERPGs and AEGLs were averaged over 1-hour, as these values are intended for 1-hour exposures.

For this assessment, the hierarchy of sources for ATV selection was as follows with each ATV defined below:

- ➤ EPA AEGL-1. "AEGL-1 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure."
- ➤ AIHA ERPG-1. "The maximum concentration in air below which it is believed nearly all individuals could be exposed for up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor."
- ➤ DOE TEEL-1. "The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor."

AEGLs were used first when available since they are developed specifically for the purpose of acute exposure assessments. The ERPGs were selected next, prior to a substance's TEEL, because they are vigorously reviewed before they are published whereas the TEELs are not.

Example 6 shows a sample calculation of how a substance's estimated acute concentration was compared to its ATV using the aluminum concentration at 200 meters as an example.

Example 6

Sample Calculation of Comparing a Substance's Estimated Acute Concentration to Its ATV:

$$\frac{C_{acute(AI)}}{ATV} = \frac{2.02E + 01}{3.00E + 04}$$
$$= 6.72E - 04 < 1$$

In this example with AI, the ratio is less than one, indicating that further analysis is not necessary.

7. RISK CHARACTERIZATION

As previously described, the exposure assessment included calculations of time-averaged concentrations for both long-term (chronic) and short-term (acute) exposures. Using a screening approach, a substance's estimated time-averaged air concentration was then compared to chronic HBSLs or ATVs. The comparison was made using the ratio of the HBSL or ATV to the estimated concentration. This approach is conservative because the exposure assumptions used by the EPA, to establish HBSLs and ATVs, are likely to overestimate the exposures experienced by offsite residents living near firing ranges.

If this ratio was less than one, no further evaluation was needed. If the chronic or acute averaged concentrations (C_{chronic} and C_{acute}) were greater than the screening levels, resulting in a ratio greater than one, further evaluation would be warranted to determine the potential for health effects. Note that concentrations greater than the screening levels do not indicate an onset of health effects, but rather, the potential for such.

The chronic and acute assessments were conducted as outlined in Section 6.3. Appendix D presents results from the M1A1 risk characterization.

7.1 CHRONIC HEALTH RISK

The outcome of the chronic assessment indicated that no chronic health effects are expected from breathing the air emissions from the M1A1 at the 100-meter location. Since all ratios were less than one, further evaluation was not necessary. However, air concentrations were modeled at the 200-meter location for consistency with the acute assessment. The resulting ratios were even lower than for the 100-meter location.

7.2 ACUTE HEALTH RISK

The acute exposure assessment, at the 100-meter downwind hypothetical resident location, indicated that levels of lead from the M1A1 emissions were greater than the screening level. Estimated concentrations were remodeled to a distance 200

meters downwind from the firing location. The results showed that the estimated concentration of lead decreased to a safe level below the ATV. The estimated concentrations for all other substances were further reduced with all ratios below one.

The ratio of estimated lead concentrations to the ATV was 2.02 at the 100-meter location. Lead is a naturally occurring bluish-gray metal found in the earth's crust in small amounts. It is commonly used in the production of lead-acid batteries for automotive and industrial applications. Exposure to lead in the air primarily results from emissions from industrial processes. The main target for lead toxicity is the nervous system. Studies have shown that continual inhalation of lead may cause blood effects (Reference 17).

7.3 FACT SHEET

Appendix E includes a copy of the fact sheet submitted to the AEC. The fact sheet used results from this assessment to address health concerns related to inhalation of M1A1 air emissions.

8. UNCERTAINTY DISCUSSION

The limitations inherent in modeling and the added conservatism of the assessment contribute to the uncertainty of the assessment results. The risk assessment methodology typically includes safety factors that are embedded in the toxicity data to ensure adequate protection of the general population, particularly, susceptible individuals such as the sick, elderly, and children. Table 7 identifies areas of uncertainty associated with this assessment.

TABLE 7: TYPES OF UNCERTAINTY

Issue	Uncertainty	Direction of Effect
	Emissions Modeling	
Modeled versus real- time sampling	The air concentrations in this assessment were modeled. Actual air concentrations taken from the field may be higher or lower.	Varies
Frequency of use for the M1A1	Actual frequency of use for these munitions during training exercises may be different from those stated in this report.	Varies
Hypothetical resident assumed to be located directly downwind	Unless the area around the training facility is populated, the chances that a person living directly downwind is low.	Overestimates
Use of worst-case meteorological conditions	To ensure that this assessment is applicable to most training areas, worst-case meteorological conditions were used in the air model.	Overestimates
	Exposure Assessment	
Estimating time- averaged concentrations	Actual exposure from the M1A1 is intermittent. If one were to plot a person's exposure profile, the plot would consist of a series of spikes. Since current risk assessment methodology does not allow the assessment of the potential for health risks as a function of time, a single concentration, averaged over the exposure duration was used. In this assessment, the exposure durations used were 30 years and 1-hour or 15 minutes.	Varies
Comparing estimated concentration to established screening levels	The Region 3 and Region 9 HBSLs were developed assuming that the resident is exposed 350 days per year. It is unlikely for training with the M1A1 to occur for 350 days per year at a particular firing range.	Overestimates
Comparing estimated concentrations to established screening levels	Comparison to screening levels does not account for possible cumulative effects of exposure to more than one substance.	Underestimates

TABLE 7: TYPES OF UNCERTAINTY

Issue	Uncortainty	Direction of
issue	Uncertainty	Effect
Screening assessment versus calculating an average daily intake	Calculating an average daily intake allows the use of scenario-specific assumptions. However, unless the ratio of concentration to screening level approaches one, a screening assessment is useful as a first-cut evaluation.	Varies
Exposure to other munitions	Other munitions are typically used during the same training exercise. These items may contain similar or different substances from those detected in the M1A1.	Underestimates
	Toxicity Assessment	
Lack of toxicity data	Some substances were not quantitatively evaluated because they have no known toxicity data.	Underestimates
Modifying and uncertainty factors for toxicity data	Modifying factors and uncertainty factors of varying degree are typically applied to toxicological values. These factors are used to conservatively account for extrapolating from animal studies for human health assessment, and to conservatively account for variation in human populations.	Overestimates

9. CONCLUSION

Using conservative assumptions, the assessment indicated that residents who live as close as 200 meters directly downwind from the M1A1 firing location are safe from breathing air emissions from the M1A1. It is believed that the assumptions contained in this analysis are conservative enough to be protective of all the population including the sick, elderly, and children.

10. RECOMMENDATIONS

At installations where offsite residents are located less than 200-meters from the M1A1 firing location, a more site-specific evaluation is recommended. However, it should be noted that at most training installations, training areas are located over 1,000 meters (over half a mile) away from populated areas.

The results from this assessment are intended for a hypothetical training facility, and actual results may vary depending on site-specific conditions. This study used conservative assumptions (e.g., worst-case meteorological conditions, receptor located directly downwind, etc.) and it is believed that most site-specific analyses would result in even lower concentrations. Therefore, the results from this assessment should be applicable to most training facilities, unless site-specific conditions vary significantly.

11. POINT OF CONTACT

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APPENDIX B AIR DISPERSION MODELING OUTPUT DATA

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

	Cartrio	Cartridge, .50 caliber, Blank, M1A1 (M2)	lank, M1A1 ((M2)	No. of rounds (I)		round
		Number of items (ested =>	ns tested =>		release duration (t):	7	2 seconds
	Nei Explos	Net Explosive Weight - N.E.W. (lbs.) =>	W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	1,636E-04	1.636E-04 g/m 7(g/s)
		ATC Firing Test Results	Results	297			
	Average	Dally	Average	Average	Total Mass	Substance	Substance
	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emitted		Rate
Compound	Concentration	Concentration	Factor (EF)	Factor	(grams/item)	(drams/m³)	(n/illem)/cac
	(mg/m³)	(mg/m³)	(lb/llein)	(lb/lb NEW)		CONC	ER,
Permanent Gases			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Ammonia (NH3)	3.50E+00	NA	1.03E-05	1.62E-03	4.683F.03	3 834E 07	20,000
Carbon Dioxide (CO2)	7.16E+02	NA	2.11E-03	3,31E-01	9.574F-01	7.831E-0/	4.34ZE-U3
Carbon Monoxide (CO)	6.16E+02	NA	1.82E-03	2.85E-01	8.248E-01	6 747E-05	4.707E-01
Oxides of Nitrogen (NOx)	6.09E+00	NA	1.80E-05	2.82E-03	8.147E-03	6 664E-07	4.124E-01
Sulfur Dioxide (SO2)	2.62E-01	AN	7.73E-07	1.21E-04	3.5065-04	2 868E_08	4.07.5E-03
Acid Gases						200000	1.7.33E-04
Hydrogen Fluoride	2,30E-01	2.20E-01	QN	ND	QN	CN	CN CN
Hydrogen Chloride	2.25E-01	2.10E-01	Q	ND	CN	C C	QV CV
Hydrogen Bromide	2.20E-01	2.10E-01	QN	QN	CN	GN CN	2 2
Nitric Acid	2.20E-01	2.10E-01	QN	S		CN CN	ON S
Phosphoric Acid	2.20E-01	2.10E-01	QN	CN		ON CIN	QN.
Sulfuric Acid	9.95E-01	2.10E-01	4.92E-06	7.72F-04	2 2325-03	4 000F 07	NO 446F
<u>Cyanide</u>					CO-7507:7	1.020E-U/	1.116E-03
Particulate Cyanide	1.25E-02	1 20F.02	CN	CIV			
Hydrogen Cyanide	3.50E-01	2 50E.02	1 17E 08	1 045	UN	QN	Q
Particulates		£.00102	97-17-10	1,04E-U4	5.305E-04	4.340E-08	2.653E-04
Total Suspended Particulate	2.77E+01	NA NA	9 26F-05	1 45E-02	A 100E 00	20 107 0	
Particulate Matter <10 microns	3.13E+01	NA	1.04E-04	1 64F-02	4 737E.02	3.434E-00	Z.099E-02
Particulate Matter <2.5 microns	2.81E+01	AA	9.38E-05	1 47E-02	4 2675 02	3.073E-00	2.369E-02
Metals					**************************************	3.4025-00	Z.1Z8E-0Z
Aluminum	5.81E-01	4.34E-02	1.94E-08	3.05F-04	A ROKE OA	7 2002	. 0 00. 1
Antimony	3.18E+00	9.88E-01	7.67E-06	1 20F-03	3 480 = 03	7.203E-08	4.403E-04
Arsenic	1.04E-02	1.09F-02	CN	ON	NN NIN	Z.040E-U/	1./40E-03
Barium	1.36E+00	4.34E-02	4 54F-06	7 13E-04	O Deate On	UN COST	QN
Beryllium	4.15E-02	4.34E-02	GN	ND	Z:001E-03	1.080E-U/	1.030E-03
Cadmium	4.15E-02	4.34E-02	QN	2		2 2	
Calcium	2.87E-01	1.99E-01	3 73E-07	5 855.05	1 800 04	ON O	ON
Per comment representatives and the contractive of		T	21.01.01	0.00L-00.0	1.08UE-04	1.382E-08	8.450E-05

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

			一 できる できる かん かんかん	1	il spillog in		1 round
		Number of Items tested =>	ns tested =>		release duration (t):	2	2 seconds
	Net Explor	Net Explosive (Veight - N.E.W. (lbs.) =>	.W. (lbs.) =>	8.37E-03	Unit Concentration (UC):	1.638E-04	1,638E.04 a/m³/(a/s)
		ATC Firing Test Results	Results				
	Average	Daily	Average	Average	Total Mass	Calbetanoo	
	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Substance
	Actual	Background	Emission	Emission	Emilled		Conssion
Compound	Concentration	Concentration	Factor (EF)	Factor	Gramsolem	(Grands (m.3)	
A. C.	(mg/m³)	(mg/m³)	(upyrem)	(IB/IB NEW)		CONC	(g/item)/sec
Chromlum	4.15E-02	4.34E-02	QN	QN	CN CN	CIN	
Cobalt	4.15E-02	4.34E-02	QN	QN	CN CN	ON CIV	
Copper	4.13E-01	9.30E-02	1.11E-06	1.74E-04	5 017E-04	A 40AE OO	ON
Lead	3.73E+00	5.95E-02	1.22E-05	1.92E-03	5.554F-03	4.104E-00	2.509E-04
Magnesium	4.15E-02	4.34E-02	Q	QN	CN	1.343E-07	Z.///E-U3
Manganese	4.15E-02	4.34E-02	QN	CN	CN	ON CIN	QN
Nickel .	4.15E-02	4.34E-02	CN	CN	OIN	QN S	Q.
Selenium	1.04E-02	1.09E-02	Q.	S		ON S	QN
Silver	4.15E-02	4.34E-02	QN	S		2	Q
Thallium	4.15E-02	4,34E-02	S	Q CN	ON ON	2	2
Vanadium	4,15E-02	4.34F-02	S			QN	Q
Zinc	1.48E-01	4 34E.02	A DAE 07	7 755 05		ON	QN
TO:11 Carbonyis		30 31 00	1.010	CO-3C//	Z.Z40E-04	1.832E-08	1.120E-04
Formaldehyde	2 46F-02	1 235 04	0 101 00	100			
Acetaldehyde	1 ROF-01	1 805 04	0.19E-U8	1.29E-U5	3.715E-05	3.039E-09	1.857E-05
Acetone	1 19F+00	1 10E+00	ON CA		QN	ON	QN
Acrolein	2.29F-01	2 29E-01			QN	Q	QN
Proprionaldehyde	2.37E-01	2.37E-01	S S		ON	QN .	Q
Crotonaldehyde	2.87E-01	2.87E-01	2	Q Z	ON NI	Q S	2
Butyraldehyde	2.95E-01	2.95E-01	S	CN	GN GN	2	Q
Benzaldehyde	4.34E-01	4 34E-01			ON	9	QN
Isovaleraldehyde	3 52E-01	3 525 04	2 2		ON	QN	QN
Valeraldehyde	3 52E.04	3 EDE 04			QN	Q	Q
o,m,p-Tolualdehyde	4 94E-01	3.02E-01		2	QN	QN	Q.
Hexaldehyde .	4 10E.01	4.915-01		Q :	ON.	QN	QN
2.5-Dimethylbenzaldehyde	A 40E 04	** 10E-01		2	QN	QN	S
VOCs		4.10E-01	ON.	Q	ON	QN	QN
Probene	0.475.00	201-101-7				Ten year	アンプランス
	9.47E-U3	1./ZE-03	3.16E-08	0	1.433E-05	1.172E-09	7.166F-06

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

	Cartrio	Cartridge, .50 caliber, Blank, M1A1 (M2)	lank, M1A1 (M2)	No. of rounds (I)		round
		Number of items tested =>	ns tested =>		release duration (t):	2	seconds
	Net Explos	Net Explosive Weight - N.E.W. (lbs.) =>	W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	1.636E-04	1.636E-04 g/m 7(g/s)
		ATC Firing Test Results	Results				
	Average	Dally	Ауегаль	Averane		Culhatanac	
	Measured	Measured	Adjusted	Adiusted	of Suhstance	Concentration	Substance
	Actual	Background	Emission	Emission	E E E		Chillosholl
Compound	Concentration	Concentration	Factor (EF)	Factor	(drams/llem)	(cirame/m³)	Cambinitions
44	(mg/m³)	(mg/m²)	(IIb/Item)	(Ib/Ib NEW)		CONC	ER, SEC
Dichlorodiflouromethane	2.97E-03	2.97E-03	1.14E-09	1.79E-07	5.167E-07	4 227E.11	2 58AE 07
Chlorodifluoromethane	3.54E-03	3.54E-03	QN	ND	ON	CN	ON ON
Freon 114	6.99E-03	6.99E-03	QN	QN	ON	GN	S
Chloromethane	1.55E-03	2.07E-03	5.14E-09	8.07E-07	2.331E-06	1.907E-10	1.166F-06
Vinyl Chloride	2.56E-03	2.56E-03	QN	8	ON	QN	CN
1,3-Butadiene	2.21E-03	2.21E-03	QN	2	QN	QN	CN
Bromomethane	3.88E-03	3.88E-03	QN	QN ON	ON	GN	S
Chloroethane	2.64E-03	2.64E-03	QN	QN	ON	QN	CZ
Dichlorofluoromethane	4.21E-03	4.21E-03	QN	ON	QN	QN	CZ
Trichloroflouromethane	1.69E-03	1.69E-03	6.47E-10	1.02E-07	2.935E-07	2.401E-11	1.468F-07
Pentane	2.95E-03	2.95E-03	QN	Q	QN ·	ND ND	GN S
Acrolein	1.03E-02	2.29E-03	3.44E-08	5.41E-06	1.563E-05	1.278E-09	7.813F-06
1,1-Dichlorethene	4.05E-03	4.05E-03	QN	QN	QN	N	QN
Freon 113	7.68E-03	7.68E-03	QN	QN	QN	QN	GN
Acetone	1.86E-01	6.89E-02	4.16E-07	6.53E-05	1.888E-04	1.544E-08	9.438E-05
Methyl lodide :	5.81E-03	5.81E-03	ND	QN	QN	QN	QN
Carbon Disulfide	3.11E-03	3.11E-03	QN	QN	QN	QN	QN
Acetonitrile	5.88E-03	1,68E-03	1.96E-08	3,07E-06	8.869E-06	7.255E-10	4.434E-06
3-Unioropropene	3.13E-03	3.13E-03	9	S	QN	QN	QN
Methylene Onlonge		2.78E-02	1.89E-07	2.97E-05	8.587E-05	7.024E-09	4.293E-05
Reft-Bulyl Alconol	3.03E-03	3.03E-03	2	2	QN	QN	GN
Aciyioliitille		2.17E-03	6.88E-09	1.08E-06	3.120E-06	2.552E-10	1.560E-06
trans-1,2-Dichloroethene	3.96E-03	3.96E-03	QN	QN	GN	QN	QN
wernyi t-butyi ether	3.61E-03	3.61E-03	Q	Q	ND	QN	QN.
нехапе	1.27E-01	5.64E-02	2.55E-07	4.01E-05	1.158E-04	9.476E-09	5.792E-05
i, I-Dichloroethane	3.97E-03	3.97E-03	QN	Q	QN	QN	QN
Vinyl Acetate	3.52E-03	3.52E-03	QN	ON	ΩN	QN	QN
cis-1,Z-Dichloroethene	3.96E-03	3.96E-03	Q	QN	ON	QN	QN

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

	Cartrio	Cartridge, .50 caliber, Blänk, M1A1 (M2)	llank, M1A1 (M2)	No. of rounds (I)	100	round
		Number of Items tested =>	ms tested =>		release duration (t):	2	2 seconds
	SOID TO SOID	Net Explosive Weight - N.E.W. (lbs.) =>	.W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	1,636E-04 q/m //q/s	a/m,/(a/s)
		ATC Firing Test Results	Results				2
	Average	Dally	Average	Averade	Total Maca	Cubalance	
	Measured	Measured	Adjusted	Adjusted	of Silbstance	Condontration	Substance
	Actual	Background	Emission	Emission		Concernation	EIIII8SION
Compound	Concentration	Concentration	Factor (EF)	Factor			Kale
	(mg/m³)	(mg/m)	(lb//tem)	(Ib/Ib NEW)		CONC	(g/item)/sec
2-Butanone	2.95E-03	2.95E-03	QN	CN			40 m
Ethyl Acetate	3.60E-03	3.60E-03	GN	CN	ON ON	ON	ON
Methyl Acrylate	3.52E-03	3.52E-03	GN	GN	Q. N	ON S	QN
Chloroform	4.88E-03	4.88E-03	GN	CN			Q
1,1,1-Trichloroethane	1.36E-03	2.18E-03	CN	S		ON	S
Carbon Tetrachloride	6.29E-03	6.29E-03	QN	CN		2	QN
1,2-Dichlorethane	4.05E-03	4.05E-03	S	S		ON	QN
Benzene	7.03E-02	6.39E-04	2.33E-07	3 65E-05	1 0665 04	ON COOK	QN
Isooctane	4.67E-03	4.67E-03	Q	UN	PO-TICON.	8.630E-09	5.275E-05
Heptane	4.10E-03	4.10E-03	S	S S		ON.	Q
Trichloroethane	4.88E-03	4.88F-03		2 2		Q.	ND
Ethyl Acrylate	4.09E-03	4 00F.03				8	ND
1,2-Dichloropropane	4 62F-03	4 ROE 03	2 2	2	ON	Q	QN
Methyl Methacrylate	4 09F.03	4.02E-03	2 2		QN	ON	QN
Dibromomethane	7.11E-03	7 11E 03		QN	ND	ON	QN
1,4-Dibxane	3.60E-03	3 ROE-03	2 2		QN	QN	ON
Bromodichloromethane	6.70E-03	6 70F-03			ON	2	. ON
4-Methyl-2-Pentanone	4.10E-03	4.10E-03			ON ON	QN.	S
Toluene	3.77E-03	3.77E-03	1.26F-08	1 07E-08	CM CADOF OR	ON S	Q
Octane	4.67E-03	4.67E-03	CN	ON CIV	0.088E-00	4.662E-10	2.850E-06
trans-1,3-Dichloropropene	4.54E-03	4.54E-03				QN	QN
Ethyl Methacrylate	4.67E-03	4.67F-03				QN	QN
1,1,2-Trichloroethane	5.46E-03	5.46F-03			ON	QN	ON
Tertrachloroethene	6.78E-03	6.78F-03			ON	Q	QN
2-Hexanone	4.10E-03	4 10F-03			ON	QN	QN
Dibromochloromethane	8,52E-03	8 52E.03			ON	QN	QN
1,2-Dibromoethane	7,68E-03	7.68E-03			ON I	QN	ND
Chlorobenzene	4 60F-03	4 ROE 03	2 2		ON	QN	S
Security opportunities with an absolute control of the control of	20.700	4.00E-03		GN	QN	Q	S

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

	Cartrid	Cartridge, .50 caliber, Blank, M1A1 (M2)	lank, M1A1 (42)	No. of rounds (I)		round
		Number of items tested =>	ms tested =>	- 11	release duration (t):	2	seconds
	Net Explos	Net Explosive Weight - N.E.W. (lbs.) =>	W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	1,636E-04	1.636E-04 g/m³/(g/s)
		ATC Firing Test Results	Results				
	Average	Dally	Average	Average	Total Mass	Substance	Substance
	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emilled		Rate
Compound	Concentration	Concentration	Factor (EF)	Factor	(gráms/item)	(grams/m³)	(g/item)/sec
	(mg/m³)	(mg/m³)	(lb/ltem)	(Ib/Ib NEW)		SONC	R.
1,1,1,2-Tetrachloroethane	6.87E-03	6.87E-03	QN	QN	QN	QN	QN
Ethylbenzene	4.34E-03	4.34E-03	QN	QN	QN	QN	QN
m/p-Xylene	2.61E-03	4,34E-03	8.76E-09	1.38E-06	3.975E-06	3.252E-10	1.988E-06
o-Xylene		4.34E-03	QN	ΩN	QN	QN	QN
Styrene	2.56E-03	4.26E-03	8.60E-09	1.35E-06	3.900E-06	3,190E-10	1.950E-06
Bromoform	1.03E-02	1.03E-02	QN	QN	QN	S	QN
Cumene	4.92E-03	4.92E-03	QN	ON	QN	QN	QN
1,1,2,2-Tetrachlorethane	6.87E-03	6.87E-03	QN	QN	QN	QN	QN
1,2,3-Trichloropropane	6.03E-03	6.03E-03	QN	'GN	QN	QN	QN
Bromobenzene	6.42E-03	6.42E-03	QN	QN	QN	QN	QN
4-Ethyltoluene	4.92E-03	4.92E-03	QN	QN	QN	QN	S
1,3,5-Trimethylbenzene	4.92E-03	4.92E-03	QN	QN	QN	S	S
Alpha Methyl Styrene	4.83E-03	4.83E-03	ND	QN	QN	QN	QN
1,2,4-Trimethylbenzene	4.92E-03	4.92E-03	ON	QN	QN	Q	QN
1,3-Dichlorobenzene	6.01E-03	6.01E-03	ΩN	ΩN	QN	QN	QN
1,4-Dichlorobenzene		6.01E-03	QN	QN	QN	QN	QN
Benzyl Chloride	5.18E-03	5.18E-03	QN	ON	QN	QN	QN
1,2-Dichlorobenzene	6.01E-03	6.01E-03	QN	QN	ON	QN	QN
Hexachlorethane	9.68E-03	9.68E-03	Q	QN	ON	QN	QN
1,2,4-i richlorobenzene	7.42E-03	7.42E-03	Q	QN	ON	QN	QN
Hexachlorobutadiene	1.07E-02	1.07E-02	QN	QN	QN	Q	ON
VOC Tentatively Identified Compounds	unds (TICs)				4		
Hydrogarbons		3 12 12 12 13 13 13 13 13 13 13 13 13 13 13 13 13		2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.			
Methane	1.96E+00	9.58E-01	3.73E-06	5.85E-04	1,690E-03	1.382E-07	8.448E-04
Ethylene	1.12E-01	2.29E-02	3.72E-07	5.84E-05	1.688E-04	1.381E-08	8.441E-05
Acetylene	5.99E-02	2.13E-02	2.00E-07	3.14E-05	9.073E-05	7.422E-09	4.536E-05
Ethane	2.46E-02	2.46E-02	QN	QN	QN	QN	QN
Propylene	3.44E-02	3,44E-02	QN	QN	ON	GN	QN
		***************************************		·			4

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

	Cartrid	Cartridge, 50 caliber, Blank, M1A1 (M2)	lank, M1A1 (No. of rounds (I)		round
	3	Number of Items tested =>	ms tested =>		release duration (t):	2	seconds
	Net Explos	Explosive Weight - N.E.W. (lbs.) =>	.W. (Ibs.) =>	6.37E-03	Unit Concentration (UC):	1.636E-04	1.636E-04 g/m³/(g/s)
		ATC Firing Test Results	Results	* **			
	Average	Dally	Average	Anning			
	Mensured	Measurad	Ardineted	President	I OTHER WASS	Substance	Substance
· · · · · · · · · · · · · · · · · · ·	Actinal	Backarailad	Contractor	rojnaten Emiliaten		Concentration	Emission
Commission				Emission			Rate
punoduos	Confeantation	Concentration	Factor (EF)	Factor	(grams/llem)	(grams/m³)	(g/item)/sec
	(mg/m²)	(mg/m³)	(lb/item)	(Ib/Ib NEW)		CONC	W.
Propane	3.61E-02	3.61E-02	QN	QN	QZ	CN	Ç.
Propyne	3.20E-02	3.20E-02	g	QN	GN	CIN	ON CN
Isobutane	4.75E-02	4.75E-02	GN	QN	QN	QN	ON C
1-Butene/Isobutylene	9.18E-02	9.18E-02	Q	ON	QX	GN CN	QN CN
1,3-Butadiene/butane	4.59E-02	4.59E-02	QN	QN	GN	CN	
cis-butene	4.59E-02	4.59E-02	QN	QN	GN	CN	
1-Butyne	4.59E-02	4.59E-02	S	QN	CN		2 2
trans-Butene	4.59E-02	4.59E-02	QN	QN	CX	QN QN	
2-Butyne	4.42E-02	4.42E-02	QN	QN	CN		S S
n-Pentane	5.90E-02	5.90E-02	S	S	GN		
n-Hexane	1.01E-01	7.05E-02	2.85E-07	4,48E-05	1 295F-04	1 050E 00	ON AND OF
SVOCS						1.0091-00	0.4/4E-UD
N-nitrosodimethylamine	1.80E-02	1,86E-02	QV	1	S	N	CIV
Bis(2-chloroethyl)ether	1.80E-02	1.86E-02	QN	QN	QN	Q Q	ON CIN
Phenol	1.80E-02	1.86E-02	S	S	QN	G C	2 2
2-chlorophenol	1.80E-02	1.86E-02	QN	ON	QN	S	
1,3-dichlorobenzene	1.80E-02	1.86E-02	Q	QN	QN	GN CN	
1,4-dichlorobenzene	1.80E-02	1.86E-02	QN	Q	ON	QN	CN
1,2-dichiorobenzene	1.80E-02	1.86E-02	Q	QN	QN	QN	S
Bio/2 objections with the	1.80E-02	1.86E-02	QN	Q	ON	QN	GN
2-mothylphonol	1.80E-02	1.86E-02	Q	QQ	QN	QN	ND
Liverpless	1.80E-02	1.86E-02	2	ND ND	QN	QN	N
riexaciiloroemane	1.80E-02	1.86E-02	Q	QN S	QN	- QN	GN
N-Introso-di-n-propytamine	1,80E-02	1.86E-02	QN	QN	QN	S	CN
4-memyipnenol	1.80E-02	1.86E-02	ON	QN	QN	QN	QN
Nillobenzerje	1.80E-02	1.86E-02	ON	QN	QN	Q.	CN
Isopnorone	1.80E-02	1.86E-02	QN	QN	QN	GN	QN
z-nitrophenol	1.80E-02	1.86E-02	QN	QN	ND	CN	CIN
		**************************************	**************************************			2	2

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

Methane Concession of the conc	Net Explos	Number of items tested =>	is tested =>		rologen direction (1).	6	
Conc (a) (a) (a) (b) (b) (c) (d) (d) (d) (d) (d) (e) (e) (e) (e) (e) (e) (e) (e) (e) (e	Net Explos	IND WOLVE NEW	A PROPERTY OF	2000	ומומשה חחושווחוו (ולו	4	seconds
Con 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		ING TRUIBING TRUES	W. (108.) =>	6,37E-03	Unit Concentration (UC):	1.636E.04	1.636E.04 g/m 7(g/s)
Con 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10.30	ATC Firing Test Results	Results				
Con 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Average	Dally	Average	Average	Total Mass	Substance	Substance
Con 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	feasured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
ane 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		Background	Emission	Emission	Emitted		Rate
ane 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ncentration	Concentration	Factor (EF)	Factor	(grams/item)	(grams/m³)	(g/ltem)/sec
ane 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(mg/m²)	(wg/m.)	(maji/aii)	(ID/ID NEW)		CONC	ER
ane 1	.8UE-02	1.86E-02	Q N	QN	QN	GN	QN
ene	.80E-02	1.86E-02	ON.	ON	ON	QN	QN
99ne 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	.80E-02	1.86E-02	QN	QN	QN	QN	GN
90e	.80E-02	1,86E-02	ND	Q	QN	QN	CN
ene 1		1.86E-02	3.06E-08	4.80E-06	1.388E-05	1.136E-09	6.941F-06
ene	.80E-02	1.86E-02	QN	S	QN	QN	CN
ene	.80E-02	1.86E-02	Q	QN	ON	QN	CN
ene	.80E-02	1.86E-02	S	QN ON	ND	GN	GN
tadiene	.80E-02	1.86E-02	S	QN	QN	S	QN CN
	.80E-02	1.86E-02	2	Q.	ND	GN	
	.80E-02	1.86E-02	QN	S	QN	QN.	CN
	.80E-02	1.86E-02	QN	S	QN	2	CN
	.80E-02	1.86E-02	QN	QN	QN	QN	CN
	.80E-02	1.86E-02	QN	QN	QN	ON.	CN
	.80E-02	1.86E-02	ND	9	QN	QN.	QN
	.80E-02	1.86E-02	ON ·	Q	QN	ON	QN
ine	.80E-02	1.86E-02	QN	QN	QN	S	S
9	.80E-02	1.86E-02	QN	ON	QN	QN	QN
	1.60E-02	3.71E-02	QN	QN	QN	QN	QN N
3	.60E-02	3.71E-02	QN	Q	ND	QN	S
	.80E-02	1.86E-02	Q	Q	QN	QN	S
7.4-difficioluene	.80E-02	1.86E-02	Q	Q	ND	QN	QN
3	.60E-02	3.71E-02	Q.	ND	QN	QN	ND
	.80E-02	1.86E-02	ON O	QN	ΩN	QN	QN
menylether 1	.80E-02	1.86E-02	2	QN	QN	QN.	QN
1.8	1.80E-02	1.86E-02	2	QN	ND	QN	ND
5 6	3.60E-02	3.71E-02	Q	Q	QN	ON	QN
4,o-dinitio-z-metnylphenol 3.6	,60E-02	3.71E-02	2	ON	QN	QN	QN N

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

	Cartric	Cartridge, .50 caliber, Blank, M1A1 (M2)	Jank, M1A1 ((M2)	No. of rounds (I)		1 round
	Man	Number of Ite	Number of items tested =>	7	release duration (t):	2 2	2 seconds
	Mel Explo	Net Explosive Weight - N.E.W. (lbs.) =>	.W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	1.638E-04	1.638E-04 a/m3/(a/s)
		ATC Firing Test Results	Results				
3	Average	Daily	Average	Average	Total Mane	Cottostowan	
-	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emitted		Date
Compound	Concentration	Concentration	Factor (EF)	Factor	(grams/item)	(arams/m³)	(million)/And
	(mg/m³)	(mg/m³)	(lb/llem)	(Ib/Ib NEW)		CONC	(g/itemly/sec
N-nitrosodiphenylamine(1)	1.80E-02	1.86E-02	QN	CN	ND NIC	3.0	
4-bromophenyl-phenylether	1.80E-02	1.86E-02	QN	QN		QN	ON.
Hexachlorobenzene	1.80E-02	1.86E-02	GN	S	ON ON	ON S	ON
Pentachlorophenol	3.60E-02	3.71E-02	Q	S		ON S	QN
Phenanthrene	1.80E-02	1.86E-02	Q	CN	ON UN		ON.
Anthracene	1.80E-02	1.86E-02	Q	CN	ON ON	ON S	2
Di-n-butylphthalate	1.80E-02	1.86E-02	CN	S	ON ON	ON	QN
Fluoranthene	1.80E-02	1.86E-02	CN			Q.	Q
Pyrene	1.80E-02	1 RRE-02	S		ON C	<u>S</u>	QN
Butylbenzyiphthalate	1.80F-02	1 ARE-02		2 2	QN	QN	ON
Benzo(a)anthracene	1 ROE 02	1.00E-02	Q (ON!	QN	ON	QN
Chrysene	4 90E 00	1.00E-UZ	Q !	Q	ND	QN	QN
3.3-dichlorohenzidine	4 90F 00	1.00E-UZ	QN.	Q	QN	ON	QN
Rie(2_ethylhoxylhabthalata	1.00E-02	1.86E-02	QN	Q	QN	QN	GN
Din-octylphthalate	3.95E-01	7.79E-01	Q	QN	QN	QN	CN
Berzo(h)(Ingrantion	1.80E-02	1.86E-02	Q	QN	QN	QN	CN
Ronzo(b)filozonthono	1.80E-02	1.86E-02	Q	Q	QN	QN	QN
Ponzo(n)monal mene	1.80E-02	1.86E-02	Q	ON	ON	QN	Q C
Indepo(4.2.3 columnations	1.80E-02	1.86E-02	Q	QN	QN	Q	S
Dibenz(a h)anthracona	1.80E-02	1.86E-02	2	QN	QN	2	E
Ronzola h Daordona	1.80E-02	1.86E-02	QN	QN	QN	QN	GN
SVOC Tentathole In the	1.80E-02	1.86E-02	ND	QN	QN	CN	S
TO 42 the state of	unds (TICs)						
JOSE RAMS						N. 1857	8.4
Naphinalene	6.39E-03	2.60E-03	1.36E-08	2.14E-06	6.178E-06	K 083E 40	2 000r
Acenaphthylene	1.60E-04	1.86E-05	5.36E-10	8.42E-08	2 433F.07	4 000E 44	3.009E-00
Acenaphthene	3.87E-05	2.23E-05	6.32E-11	9.92E-09	2 867E-08	- 990E-11	1.21bE-U/
Fluorene	4.93E-05	1.86E-05	1.65E-10	2.59E-08	7.47RE-08	2.349E-12	1.434E-08
Phenanthrene	8.79E-05	5 19E-05	1 40E 10	2000	7,470E-00	6.115E-12	3.738E-08
		20.12	1,705-10	4.4UE-U0	6,3/1E-08	5.211E-12	3.185E-08

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

	Cartrid	Cartridge, .50 caliber, Blank, M1A1 (M2)	lank, M1A1 (W2)	No. of rounds (I)		round
		Number of Items tested =>	ns tested =>	7.	release duration (t):	2	
	Not Explos	Not Explosive Weight - N.E.W. (lbs.) =>	W. (lbs.) =>	6.37E-03	Unit Coricentration (UC):	1.638E-04	
		ATC Firing Test Results	Results	. 900 E. Kragge			
	Average	Dally	Average	Average	Total Mass	Substance	Substance
	Actual	Background	Emission	Emission	Emilled	Concentration	CMISSION
Compound	Concentration	Concentration	Factor (EF)	Factor	(drams/llem)	(orams/m³)	Colliforn Voor
	(mg/m³)	(mg/m³)	(fb/ftem)	(Ib/Ib NEW)		CONC	(grifelly)/sec
Anthracene	1.80E-05	1.86E-05	Q	QN	QN	GN	CIN
Fluoranthene	5.38E-05	1.86E-05	1.80E-10	2.82E-08	8.156E-08	6.672E-12	4 078E-08
Pyrene	5.12E-05	1.86E-05	1.71E-10	2.68E-08	7.749E-08	6,338E-12	3.874F-08
Benzo(a)anthracene	1.80E-05	1,86E-05	Q	QN	QN	QN	CN
Chrysene	1.80E-05	1.86E-05	9	NO.	QN	QN	CN
Benzo(b)fluoranthene	1.80E-05	1.86E-05	QN	QN	QN	ON	CZ
Benzo(k)fluoranthene	1.80E-05	1.86E-05	QN	QN	QN	S S	CN
Benzo(e)pyrene	1.80E-05	1.86E-05	QN	QN	QN	QN	CZ
Benzo(a)pyrene	1.80E-05	1.86E-05	Q	QN	QN	QN	CN
Indeno(1,2,3-cd)pyrene	1.80E-05	1.86E-05	QN	Q	ON	QN	CN
Dibenz(a,h)anthracene	1.80E-05	1.86E-05	QN	QN	QN	ON	CN
Benzo(g,h,i)perylene	1.80E-05	1.86E-05	QN	Q	QN	QN	CZ
Dioxins and Furans							10 May 1 May
2378-TCDD		4.16E-09	QN	9	ND ON	ON	CZ
12378-PECDD	2.97E-09	2.33E-09	QN	QN	QN	QN	CN
123478-HXCDD	2.88E-09	2.17E-09	QN	QN	QN	QN	QN
123678-HXCDD	2.96E-09	2.21E-09	Q	Q	QN	QN	ND
123788-HACDU	2.74E-09	2.06E-09	S	QN	QN	QN	QN
1234676-FPCUU		3.73E-09	5.14E-15	8.06E-13	2.330E-12	1.906E-16	1.165E-12
2978 TOPE	6.67E-08	4.43E-08	9.21E-14	1.45E-11	4.179E-11	3.418E-15	2.089E-11
40070 PFORF		1.72E-09	QN	QN	ND	QN	Q
12378-PECDF		2.09E-09	Q	ND	QN	S	QN N
23478-PECUI-	2.62E-09	2.13E-09	S	QN	QN	QN	QN
1234/8-HXCDF	1.72E-09	1.32E-09	Q	DN	QN	ON	QN
1236/8-HXCDF	1.75E-09	1.32E-09	Q	ON	QN	QN	QN
123789-HXCDF	4.49E-09	3.45E-09	2	QN	, ON	QN	QN
2346/8-1-1XCIJF	1.92E-09	1.42E-09	Q	QN	QN	S	QN
1234078-FIPCDF	1.42E-09	1.27E-09	9.82E-16	1.54E-13	4.456E-13	3.645E-17	2.228E-13

Table B-1: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 100 meter location

	Cartric	Cartridge, .50 callber, Blank, M1A1 (M2)	lank, M1A1 (₩2)	No. of rounds (I)		1 round
		Number of Items tested =>	ns tested =>		release duration (t):	2	seconds
	Net Explor	Net Explosive Weight - N.E.W. (lbs.) =>	W. (lbs.) =>	8.37E-03	Unit Concentration (UC):	1.636E-04	1.636E-04 q/m 7(q/s)
		ATC Firing Test Results	Results				
	Average	AlleO	Average	Average	Tolal Mass	Substance	Substance
	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emilled		Rale
Compound	Concentration	Concentration	Factor (EF)	Factor	(grams/ilem)	(grams/m³)	(tr/ilem)/sec
	(mg/m³)	· (mg/m³)	(lb/itam)	(Ib/Ib NEW)		CONC	ER
1234789-HPCDF	2.21E-09	2.54E-09	QN	QN	QN	CN	CN
OCDF	4.46E-09	3.65E-09	1.49E-14	2.34E-12	6.761E-12	5 531F-16	3 384 € 42
Energetics	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						0.00112-112
Nitrobenzene	3.51E-03	NA	QN	ON	QN	CN	
2-Nitrotoluene	3.51E-03	NA	QN	ON ON	ND	QN	
3-Nitrotoluene	3.51E-03	NA	QN	QN QN	ND	QN	CN
4-Nitrotoluene	3.51E-03	NA	QN	QN QN	ND	CN	CN
Nitroglycerine	3.51E-03	NA	QN	Q	QN	CN	GN
1,3-Dinitrobenzene	3.51E-03	NA	QN	QN	QN	QN	S
2,6-Unitrotoluene	3.51E-03	NA	QN	Q	QN	GN	CN
Z,4-Uinitrotoluene	3.51E-03	NA	QN	Q	QN	QN	CN
1,3,5-1 rinitrobenzene	3.51E-03	NA	S	GN	GN	QN	QN N
Z,4,0~1 IIIIII OlOluene	3.51E-03	VΑ	Q	Q	ND	N N	S
4-Amino. 2 6-Dinitrataluses	3.51E-03	AN	QN	S	QN	QN	QN
2-Amino-4 6-Dinitrotolugue	3.51E-U3	NA V	2	QN :	ND	ON	N
Tetrol	3.3 IE-03	AN S	2	Q	ND	QN	QN
LINAX		NA	2	QN	ON	S	QN
Donger	7.02E-03	NA	Q	ND	ON	QN	S
Peruaeryumuomenaminare Dibutul abtholote	7.02E-03	NA	Q	QN.	DN	QN	QN
Disary printage	1.76E-01	Ϋ́	Q	QN	. ON	GN	S
Diociyi primalate	1.76E-01	ΝΑ	QN N	QN	QN	9	QN
Uipnenyiamine	8.78E-02	NA	ND	ON O	ND	Q	QN
Footnotes:							

'ATC = Aberdeen Test Center (for additional information on the data, refer to the Firing Point Emission Study)

NA = Not Applicable ND = Not Detected

Table B-2: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 200 meter location

	Cartridge	Cartridge, :50 callber, Blank, M1A1 (M2)	ink, M1A1 (M	2)	No. of rounds (I)		1 Found
		Number of Items tested =>	ns tested =>	二世月11年 吳	release duration (t):		3 seconds
	Net Explos	sive Weight - N.E.W. (lbs.) ≕>	W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	6,870E-05	(g/g/k)
	ATC	ATC Firing Test Results	ults				
	Average	Daily	Average	Average	Total Mass	Substance	Substance
8-7	Actual	Beckground	Adjusted	Adjusted	of Substance	Concentration	Enission
Compound	Concentration	Concentration	Earthy (EE)	Citiission		(grams/m²)	Rate
	("W/Bw)	(mg/m)	(lb/litem)	(Ib/Ib NEW)	(grams)	CONC	(g/llem)/sec
Permanent Gases		Section 18					
Ammonia (NH3)	3.50E+00	AN	1.03E-05	1.62E-03	4.683E-03	1 072F-07	1 554E 03
Carbon Dioxide (CO2)	7.16E+02	NA	2.11E-03	3.31E-01	9.574E-01	2.192E-05	3.1915.01
Carbon Monoxide (CO)	6.16E+02	NA	1.82E-03	2.85E-01	8.248E-01	1.889E-05	2.749F-01
Oxides of Nitrogen (NOx)	6.09E+00	NA	1,80E-05	2.82E-03	8.147E-03	1.866E-07	2.716E-03
Sulfur Dioxide (SO2)	2.62E-01	NA	7.73E-07	1.21E-04	3.506E-04	8,028E-09	1.169E-04
Acid Gases							The same of the sa
Hydrogen Fluoride	2.30E-01	2.20E-01	QN	S	QN	QN	GN
Hydrogen Chloride	2.25E-01	2.10E-01	ON	QN	QN	QN	QN
Hydrogen Bromide	2.20E-01	2.10E-01	ON	QN	QN	QN	QN
Nitric Acid	2.20E-01	2.10E-01	QΝ	<u>Q</u>	QN	QN	GN
Phosphoric Acid	2.20E-01	2.10E-01	ND	QN	QN	ON	CN
Sulfuric Acid	9.95E-01	2.10E-01	4.92E-06	7.72E-04	2,232E-03	5.111E-08	7.439E-04
Cyanide							
Particulate Cyanide	1.25E-02	1.20E-02	QN	QN	QN	NO	NO NO
Hydrogen Cyanide	3.50E-01	2.50E-02	1.17E-06	1.84E-04	5.305E-04	1.215E-08	1.768E-04
Tario							
Darticulate Matter 710 mission	2.7/E+01	NA	9.26E-05	1.45E-02	4.199E-02	9.615E-07	1.400E-02
Derticulate Matter < 10 microns	3.13E+01	NA	1.04E-04	1.64E-02	4.737E-02	1.085E-06	1.579E-02
Motole	2.81E+01	NA	9.38E-05	1.47E-02	4.257E-02	9.748E-07	1.419E-02
Aluminam	20 210 2						
Alumnum	5.81E-01	4.34E-02	1.94E-06	3.05E-04	8.805E-04	2.016E-08	2.935E-04
Anumony	3.18E+00	9.88E-01	7.67E-06	1.20E-03	3.480E-03	7.968E-08	1.160E-03
Alsenic	1.04E-02	1.09E-02	Q	Q	ON	ON	QN
barum	1.36E+00	4.34E-02	4.54E-06	7.13E-04	2.061E-03	4,719E-08	6.870E-04
Seryinum	4.15E-02	4.34E-02	<u>Q</u>	2	ON	NO ON	QN
Calmum	4.15E-02	4.34E-02	QN	Q	ON	QN	ND
Calcum	2.87E-01	1.99E-01	3.73E-07	5.85E-05	1.690E-04	3.870E-09	5.633E-05

	Cartridg	Cartridge, .50 caliber, Blank, M1A1 (M2	ink, M1A1 (M	2)	No. of rounds (I)		1 round
		Number of Items tested =>	ms (ested =>		release duration (t):	3	3 seconds
	Net Explos	osive Weight - N.E.W. (ibs.) =>	.W. (lbs.) =>	6,37E-03	Unit Concentration (UC):	6.870E-05 g/m³/(g/s)	g/m³/(g/s)
		ATC Firing Test Results	្រុញស្រុ				35
	Average	Daily	Average	Average	Total Mass	Substance	Substance
	_	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emitted	(grams/m³)	Rafe
Compound	Concentration	Concentration	Factor (EF)	Factor	(grams/item)		(a/llem)/sec
	(mg/m ₃)	(m/f/m))	(lb/item)	(Ib/Ib NEW)		CONC	ER
Chromium	4,15E-02	4.34E-02	QN	Q	ND	CN	CIV
Cobalt	4.15E-02	4.34E-02	Q	QN	QN	GN	G N
Copper	4.13E-01	9.30E-02	1.11E-06	1.74E-04	5.017E-04	1.149F-08	1 672E_04
Lead	3.73E+00	5.95E-02	1.22E-05	1.92E-03	5.554E-03	1.272F-07	1 851E-04
Magnesium	4.15E-02	4.34E-02	QN	QN	QN	CN	ND CN
Manganese	4.15E-02	4.34E-02	QN	QN	QN	CN	
Nickel	4.15E-02	4.34E-02	Q	MD	QN	CN	S CN
Selenium	1.04E-02	1.09E-02	Q	QN	GN	CN	
Silver	4.15E-02	4.34E-02	Q	QN	QN	CN	S S
I hallium	4.15E-02	4.34E-02	· QN	ON	QN	CN	
Vanadium	4.15E-02	4.34E-02	QN	QN	QN	CN	
Zinc	1.48E-01	4,34E-02	4.94E-07	7.75E-05	2.240E-04	5 129F-00	7 ARRE OR
TO:11 Carbonyls					The second secon		00-T001-1
Formaldehyde	2.46E-02	1.23E-01	8.19E-08	1.29E-05	3.715E-05	8.506F-10	1 238E-05
Acetaldehyde	1.80E-01	1.80E-01	QN	QN	QN	GN	ND ON
Acetone	1.19E+00	1.19E+00	ON	QN	ON	QN	
Acrolein	2.29E-01	2.29E-01	GN	ON	QN	QN	QN ON
Proprionaldenyde	2.37E-01	2.37E-01	QN	DN	QN	QN	S.
Ciotonaldenyde Birthraldehydo	2.87E-01	2.87E-01	2	QN	QN	QN ON	QN N
Bonzaldobuda	Z.95E-UI	Z.95E-01	Q	2	ON	QN	QN
Delizaldeliyde Isosolorofdolisdo	4.345-01	4.34E-01	Q	Q	ON	Q	QN
isovaleralderiyde	3.52E-01	3.52E-01	Q	Q	ND	QN	QN
valerardenyde	3.52E-01	3.52E-01	2	Q	QN	ON.	QN
o,m,p-i oittaidenyde	4.91E-01	4.91E-01	S	QN	QN	QN	GN
riexaldenyde	4.10E-01	4.10E-01	Q	Q	ND	ND ON	QN
Z,5-Unitettiyibetizaldenyde	4.10E-01	4.10E-01	Q	QN	QN	QN	QN
Poc							
Liopene	9.471:-03	1.72E-03	3.16E-08	0	1.433E-05	3.282E-10	4.777E-06

Table B-2: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 200 meter location

	Cartildge	lge, 50 callber, Blank, M1A1 (M2)	nk, M1A1 (M	2)	No. of rounds (I)		round
		Number of items tested =>	os fested =>		release duration (t):	8	
	Net Explos	Net Explosive Weight - N.E.W. (lbs.)	W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	8.870E-05 g/m³/(g/s)	g/m ³ /(g/s)
	ATC	C Firing Test Results	nits				
i i	Average	Daily	Average	Average	Total Mass	Substance	Substance
	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emilled	(Arams/m3)	
Compound	Concentration	Concentration	Factor (EF)	Factor	(grams/Illom)		(milliam)/600
	(mg/m³)	(mg/m²)	(llb/tlem)	(ID/ID NEW)		CONC	ER:
Dichlorodiflouromethane	2.97E-03	2.97E-03	1.14E-09	1.79E-07	5.167F-07	1 4825 44	4 700r oz
Chlorodifluoromethane	3.54E-03	3.54E-03	QN	QN	CN	ND	1.1225-01
Freon 114	6.99E-03	6.99E-03	S	QN	CN		ON V
Chloromethane	1.55E-03	2.07E-03	5.14E-09	8.07E-07	2.331E-06	5 330F.11	UN)
Vinyl Chloride	2.56E-03	2,56E-03	QN	QN	GN	CIN	N. I. Z.CU/
1,3-Butadiene	2.21E-03	2.21E-03	S	QN	QN	CN	
Bromomethane	3.88E-03	3.88E-03	QN	GN	QN	CN	CIN
Chloroethane	2.64E-03	2.64E-03	QN	QN	QN	CN	QN QN
Ulchioroff and Triple 1	4.21E-03	4.21E-03	ON	ON	QN	QN	
Douglas	1.69E-03	1.69E-03	6.47E-10	1.02E-07	2.935E-07	6.722E-12	9.784F-08
Accolor	2.95E-03	2.95E-03	NO	ON	QN	QN	CN
A d Dieti	1.03E-02	2.29E-03	3.44E-08	5.41E-06	1.563E-05	3.578E-10	5 209E-08
r, r-Dicilioremene Eroon 449	4.05E-03	4.05E-03	S	QN	QN	ON	CIN
Acotono	7.68E-03	7.68E-03	2	Q	QN	QN	QN
Mathyl lodida	1.865-01	6.89E-02	4.16E-07	6.53E-05	1.888E-04	4.323E-09	6.292E-05
Carbon Disulfida	5.81E-03	5.81E-03	2	S	QN	ND	ND
Acefonitrile	5.11E-03	3.17E-03	ON POLICE	QN	QN	ND	QN
3-Chloropropene	3 13E.03	3 13E 02	1.90E-U8	3.07E-06	8.869E-06	2.031E-10	2.956E-06
Methylene Chloride	8.16F-02	2.13E-03	1 ROE 07	ND PO2E OF	ND STEEL	QN	QN
tert-Butyl Alcohol	3.03E-03	3 03E.02	ND OIL	Z.97E-U3	8.387E-U5	1.966E-09	2.862E-05
Acrylonitrile	2.06E-03	2 17E.03	A RRE DO	4 00E 00	UND	Q	ND
trans-1,2-Dichloroethene	3 96E.03	2 ORE 03	O'OOL-OO	1.00E-00	3.120E-06	7.144E-11	1.040E-06
Methyl t-Butyl Ether	3.81E.03	3.84E 03			ON .	2	ON
Hexane	1 27E-03	5.01E-03	ND OFFET 03	ON C	QN	QN	QN
1,1-Dichloroethane	3 975_03	3.04E-02	Z.55E-U/	4.01E-05.	1.158E-04	2.653E-09	3.861E-05
Vinyl Acetate	3.57E-03	3 525 03		ON S	QN	QN	QN
cis-1,2-Dichloroethene	3 06E_03	2.02L-03		ON	ON	QN .	QN
	0.3001-03	3.800-03	ON I	ON I	QN	ON	Q

Table B-2: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 200 meter location

	Cartridge	ge, 50 caliber, Blank, M1A1 (M2)	mk, M1A1 (M	2)	No. of rounds (I)		round
		VIII Delle le	ns tested		release duration (t):		seconds
	Rei Expios	ve weignt - N.E.	W. (IDS.) =>	6.37E-03	Unit Concentration (UC):	6.870E-05	6.870E-05 g/m³/(g/s)
	₹	c riring lest Kesuits	uits				
	Average Measured	Dally Measured	Average Adjusted	Average	Total Mass	Substance	Substance
	Actual	Background	Emission	Emission		Concentration (orame/m³)	EMISSION
Compound	Concentration	Concentration	Factor (EF)	Factor	(drams//tem)		g/item)/sec
4	(mg/m)	(mg/m²) 🦛	(lb/item)	(Ib/lb NEW)	大学 はない かいかん 大学	CONC	S. S
z-butanone	2.95E-03	2.95E-03	QN	QN	QN	QN	CIV
Ethyl Acetate	3.60E-03	3.60E-03	QN	QN	GN	ND ND	2 2
Methyl Acrylate	3.52E-03	3.52E-03	QN	ND	GN	QN CN	GN CN
Chloroform	4.88E-03	4.88E-03	QN.	ND	QN	QN ON	ON CN
1,1,1-Trichloroethane	1.36E-03	2.18E-03	QN	QN	QN	NN	ON ON
Carbon Tetrachloride	6.29E-03	6.29E-03	QN	ON	ND	CN	QN CN
1,2-Dichlorethane	4.05E-03	4.05E-03	Q.	QN	GN	CIV	QV V
Benzene	7.03E-02	6.39E-04	2.33E-07	3.65E-05	1.055E-04	2.416F-09	3 547E OF
Isoociane	4.67E-03	4.67E-03	QN	QN	QN	GN	ND ND
reptane	4.10E-03	4.10E-03	Q	Q	QN	CN	
l richloroethane	4.88E-03	4.88E-03	S	S	N ON	CN	
Ethyl Acrylate	4.09E-03	4.09E-03	QN	S	QN	SN	G S
ı,z-Uıcnioropropane	4.62E-03	4.62E-03	ND	Q	QN	QN QN	CN CN
Wetnyl Wetnacrylate	4.09E-03	4.09E-03	QN	ON	QN	QN	CN
Oibioindinethane	7.11E-03	7.11E-03	Q	QN	ND	QN	CN
I,4-Uloxane	3.60E-03	3.60E-03	ND	QN	QN	QN	CN
Bromodichloromethane	6.70E-03	6.70E-03	N O	QN	QN	QN	2 2
4-ivietnyl-Z-Pentanone	4,10E-03	4.10E-03	QN	QN	N S	NO NO	S
Toluene	3.77E-03	3.77E-03	1.26E-08	1.97E-06	5.699E-06	1.305E-10	1.900E-06
Octality	4.67E-03	4.67E-03	QN	QN	QN	QN	GN
Halls-1,3-Dichloropropene	4.54E-03	4.54E-03	QN	ON	ON	GN	Q
Luiyi menjadi yate	4.6/E-03	4.67E-03	S	QN	QN	QN	GN
Tertrachloroethans	5.46E-03	5.46E-03	Q	CN CN	ON	QN	QN
2.Hevanone	0.78E-03	6.78E-03	2	Q	ON	ON	QN
Dibromodyloromothens	4.10E-U3	4.10E-03	2	2	ND	ON	QN
12-Dihromoethane	6,02E-03	8.52E-03	Q.	2	ND	QN	QN.
Chlorohenzene	7.08E-03	7.58E-03	Q	2	ON	QN	QN
	4.00E-U3	4.60E-03	Q	QN N	ON	ON	QN

Table B-2: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 200 meter location

				4) in [2]	No. of rounds (I)		round
		Number of Items tested =>	ins tested =>	3 T	release duration (t):	8	seconds
	Net Explos	sive Weight - N.E.W. (lbs.) =>	.W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	6,870E-05	6,870E-05 g/m /(q/s)
	ATC	C Firing Test Results	sulta			ext. Tell	
	Average	VIEC	Averena	O CONTRACTOR OF THE PARTY OF TH			
	Measured	Measured	Adlusted	Adilisted	of Substance	Substance	Substance
3	Actual	Background	Emission	Emission	Fmilled	Carametral	Conssion
Compound	Concentration	Concentration	Factor (EF)	Factor	(grams/lem)	Alamount (Kale (dillem)/soc
	(mg/m³)	(mg/m³)	((lb/item)	(Ib/Ib NEW)		Q Q	EN STATE
1,1,1,2-Tetrachloroethane	6,87E-03	6.87E-03	QN	QN	GN	UN	
Ethylbenzene	4.34E-03	4.34E-03	QN	Q	GN		ON CIN
ın/p-Xylene	2.61E-03	4.34E-03	8.76E-09	1.38E-06	3.975E-06	9 104F-11	1 325E 08
o-Xylene	4.34E-03	4.34E-03	QN	QN	QN	CN	NIN CIN
Styrene	2.56E-03	4.26E-03	8.60E-09	1.35E-06	3,900E-06	8.931E-11	1 3005 08
Bromoform	1.03E-02	1.03E-02	QN	GN.	QN	QN	NO ON
Cumene	4.92E-03	4.92E-03	Q	QN	ON	QN	
1,1,2,2-Tetrachlorethane	6.87E-03	6.87E-03	Q	S S	ND	QN	
1,2,3-l richloropropane	6.03E-03	6.03E-03	QN	S	QN	QN	CN CN
Gromobenzene	6.42E-03	6.42E-03	Q	QN	ND	GN	CN
4-Ethyltoluene	4.92E-03	4.92E-03	QN	QN	GN	QN	GN
1,3,3-1 rimetnylbenzene	4.92E-03	4.92E-03	Q	ON	QN	ON	GN
Alpha Wetnyl Styrene	4.83E-03	4.83E-03	Q	ON	QN	QN	QN
1,2,4-1 rimetnyibenzene	4.92E-03	4.92E-03	S	ON	ON	QN	GN
1,3-Ulchiorobenzene	6.01E-03	6.01E-03	Q	Q.	ON	ON	S
I,4-Dicrioropenzene	6.01E-03	6.01E-03	Q	ND	QN	QN	CN
Benzyl Unloride	5.18E-03	5.18E-03	Q	ON O	QN	ON	ON.
Howachlandhama	6.01E-03	6.01E-03	S	ON	QN	QN	CN
1 2 A. Trichlorohenzono	9,68E-03	9.68E-03	QN	ND	ON	QN	QN
Hovachlorobuladiona	1.4ZE-U3	7.42E-03	2	QQ	QN	ON	GN
VOC Toutatively Identified Committee	1.0/E-02	1.07E-02	QN	ND	QN	ON	QN
Was remained monthled compounds (110s)	ounds (TICS)			:			
MAIL							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Wemane	1.96E+00	9.58E-01	3.73E-06	5.85E-04	1.690E-03	3.869E-08	5.632F-04
Ethylene	1.12E-01	2.29E-02	3.72E-07	5.84E-05	1.688E-04	3.866E-09	5 628E-05
Acetylene	5.99E-02	2.13E-02	2.00E-07	3.14E-05	9.073E-05	2.078E-09	3.024F-05
Ethane	2.46E-02	2.46E-02	QN	ON	QN	QN	GN
Propylene	3.44E-02	3.44E-02	9	QN	QN	N	

Table B-2: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 200 meter location

Net Explosive Weight - N.E.W. (its.) => 6.37E.03		Cartridge	Cartridge, 50 callber, Blank, M1A1 (M2)	nk, M1A1 (M		No. of rounds (I)		1 round
ATC Firing Test Results ATC Firing Test Results Average Average Average Average Average Average Average Adjusted Average Average Average Average Adjusted Average Average Average Average Average Average Average ND ND Average ND ND			Number of Iten	ns tested =>	: 25 - 11g 1.40	release duration (t):	8	seconds
Average Daily Measured Measured Measured Measured Measured Actual Actual Concentration C		Net Explosi	ve Weight - N.E.	W. (lbs.) =>	6,37E-03	Unit Concentration (UC):	6.870E-05	g/m³/(g/s)
Average Measured Adjusted		٧	Firing Test Res	ults				
Concentration Concentratio		Average	Daily	Average	Average	Total Mass	Substance	Substance
mpound Concentration Concentration Concentration Concentration Concentration Factor (EF) Factor (Ib/lem) (Ib/lem) Factor (Ib/lem) Factor (Ib/lem) Factor (Ib/lem)		Actual	Background	Fmission	Finishin	O Substance	Concentration	Emission
(mg/m²) (mg/m²) <t< th=""><th>Compound</th><th>Concentration</th><th>Concentration</th><th>Factor (EF)</th><th>Factor</th><th>(arams/lem)</th><th>(grems/m.)</th><th>Kale (dillom)/soc</th></t<>	Compound	Concentration	Concentration	Factor (EF)	Factor	(arams/lem)	(grems/m.)	Kale (dillom)/soc
3.61E-02 3.61E-02 ND ND		(mg/m)	(mgm)	(lb/item)	(Ib/Ib NEW)		CONC	ER,
3.20E-02 3.20E-02 ND ND	opane	3.61E-02	3.61E-02	S	QN	QN	CN	QN
lylene 4,75E-02 4,75E-02 ND ND Julane 9,18E-02 ND ND ND Julane 4,59E-02 4,59E-02 ND ND 4,59E-02 4,59E-02 ND ND ND 4,59E-02 4,59E-02 ND ND ND 4,59E-02 4,59E-02 ND ND ND 4,42E-02 4,59E-02 ND ND ND 4,42E-02 4,59E-02 ND ND ND 4,42E-02 4,59E-02 ND ND ND 5,90E-02 4,59E-02 ND ND ND 1,01E-01 7,05E-02 2,86E-05 ND ND ylamine 1,80E-02 ND ND ND zene 1,80E-02 ND	opyne	3.20E-02	3.20E-02	QN	QN	QN	ON ON	Q Q
lylene 9.18E-02 9.18E-02 9.18E-02 ND ND Jutane 4.59E-02 4.59E-02 ND ND ND 4.69E-02 4.59E-02 ND ND ND 5.90E-02 5.90E-02 ND ND ND ylamine 1.80E-02 ND ND ND zene 1.80E-02 ND ND ND zene <td< td=""><td>butane</td><td>4.75E-02</td><td>4.75E-02</td><td>QN</td><td>QN</td><td>ON</td><td>QN</td><td>GN.</td></td<>	butane	4.75E-02	4.75E-02	QN	QN	ON	QN	GN.
vitane 4.59E-02 4.59E-02 4.59E-02 ND ND 4.59E-02 4.59E-02 4.59E-02 ND ND 4.59E-02 4.59E-02 ND ND 4.59E-02 4.59E-02 ND ND 4.59E-02 4.59E-02 ND ND 4.42E-02 4.42E-02 ND ND 5.90E-02 5.90E-02 ND ND 5.90E-02 4.42E-02 ND ND 1.01E-01 7.05E-02 ND ND ylamine 1.80E-02 1.86E-02 ND ND ylamine 1.80E-02 1.86E-02 ND ND zene 1.80E-02 1.86E-02 ND ND zene 1.80E-02 1.86E-02 ND ND zene 1.80E-02 1.86E-02 ND ND une 1.80E-02 1.86E-02 ND ND une 1.80E-02 1.86E-02 ND ND une	Butene/Isobutylene	9.18E-02	9.18E-02	Q.	Q	ND	QN.	QN .
4.59E-02 4.59E-02 4.59E-02 4.59E-02 ND ND 4.59E-02 4.59E-02 ND ND ND 4.59E-02 4.59E-02 ND ND 4.42E-02 4.59E-02 ND ND 5.90E-02 5.90E-02 5.90E-02 ND ND 5.90E-02 5.90E-02 ND ND ND ylamine 1.01E-01 7.05E-02 2.85E-07 4.48E-05 1 ylamine 1.80E-02 1.86E-02 ND ND ND zene 1.80E-02 1.86E-02 ND ND ND <t< td=""><td>3-Butadiene/butane</td><td>4.59E-02</td><td>4.59E-02</td><td>QN</td><td>Q</td><td>QN</td><td>ND</td><td>QN</td></t<>	3-Butadiene/butane	4.59E-02	4.59E-02	QN	Q	QN	ND	QN
4,59E-02 4,59E-02 ND ND 4,59E-02 4,59E-02 ND ND 4,45E-02 4,42E-02 ND ND 5,90E-02 5,90E-02 ND ND 1,01E-01 7,05E-02 2,85E-07 4,48E-05 1 1,01E-01 7,05E-02 2,85E-07 4,48E-05 1 1,01E-01 7,05E-02 ND ND ND yl)ether 1,80E-02 ND ND ND zene 1,80E-02 1,86E-02 ND ND	-butene	4.59E-02	4.59E-02	ON	ND	QN	QN	QN.
4.59E-02 4.59E-02 ND ND 4.42E-02 4.59E-02 ND ND 5.90E-02 5.90E-02 ND ND 1.01E-01 7.05E-02 2.85E-07 4.48E-05 1.01E-01 7.05E-02 2.85E-07 4.48E-05 1.80E-02 1.80E-02 ND ND 1	3ulyne	4.59E-02	4.59E-02	QN	ND	QN	QN	QN
4.42E-02 4.42E-02 ND ND 5.90E-02 5.90E-02 ND ND 1.01E-01 7.05E-02 2.85E-07 4.48E-05 1.01E-01 7.05E-02 2.85E-07 4.48E-05 1.80E-02 1.86E-02 ND ND ylether 1.80E-02 1.86E-02 ND ND zene 1.80E-02 1.86E-02 ND ND	ns-Butene	4.59E-02	4.59E-02	QN	ON	QN	ON	ND ND
5.90E-02 5.90E-02 5.90E-02 ND ND 1.01E-01 7.05E-02 2.85E-07 4.48E-05 1 ylamine 1.80E-02 1.86E-02 ND ND ylether 1.80E-02 1.86E-02 ND ND zene	Jutyne	4.42E-02	4.42E-02	ND	ON	QN	QN	QN
ylamine 1.01E-01 7.05E-02 2.85E-07 4.48E-05 1.48E-05 ylamine 1.80E-02 1.86E-02 ND ND yl)ether 1.80E-02 1.86E-02 ND ND zene 1.80E-02 1.86E-02 ND ND	Pentane	5.90E-02	5.90E-02	Q.	QN	QN	QN	ND
ylamine 1.80E-02 1.86E-02 ND	lexane	1.01E-01	7.05E-02	2.85E-07	4,48E-05	1.295E-04	2.965E-09	4.316E-05
ylamine 1.80E-02 1.86E-02 ND ND yl)ether 1.80E-02 1.86E-02 ND ND zene 1.80E-02 1.86E-02 ND ND zene <td< td=""><td>(OCs</td><td>A STATE OF THE STA</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	(OCs	A STATE OF THE STA						
yl)ether 1.80E-02 1.86E-02 ND ND ND 1.80E-02 1.86E-02 ND	nitrosodimethylamine	1.80E-02	1.86E-02	S	QN	QN	N	QN
1,80E-02 1,86E-02 ND ND 12ene 1,80E-02 ND ND N	s(2-chloroethyl)ether	1.80E-02	1.86E-02	2	QN	QN	S	N ON
rzene 1.80E-02 1.86E-02 ND ND rropyl)ether 1.80E-02 1.86E-02 ND ND rropylamine 1.80E-02 1.86E-02 ND ND rropylamine 1.80E-02 1.86E-02 ND ND rropylamine 1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND ND 1.80E-02 1.86E-02 ND ND ND	enol	1.80E-02	1.86E-02	Q	ON	QN	N	ON
zene 1.80E-02 1.86E-02 ND ND zene 1.80E-02 1.86E-02 ND ND zene 1.80E-02 1.86E-02 ND ND oropyl)ether 1.80E-02 1.86E-02 ND ND oropyl)ether 1.80E-02 1.86E-02 ND ND oropylamine 1.80E-02 1.86E-02 ND ND	chlorophenol	1.80E-02	1.86E-02	Q	QN	QN	8	ON
zene 1,80E-02 1,80E-02 ND ND zene 1,80E-02 1,86E-02 ND ND oropyl)ether 1,80E-02 1,86E-02 ND ND oropylamine 1,80E-02 1,86E-02 ND ND oropylamine 1,80E-02 1,86E-02 ND ND ropylamine 1,80E-02 1,86E-02 ND ND 1,80E-02 1,86E-02 ND ND 1,80E-02 1,86E-02 ND ND 1,80E-02 1,86E-02 ND ND	3-dichlorobenzene	1.80E-02	1.86E-02	2	Q	ND	QN	QN
troughlether 1.80E-02 1.86E-02 ND ND bropyljether 1.80E-02 1.86E-02 ND ND sine 1.80E-02 1.86E-02 ND ND riopylamine 1.80E-02 1.86E-02 ND ND riopylamine 1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND	r-dichlorobenzene	1.80E-02	1.86E-02		QN	QN	Q	ND
oropyl)ether 1,80E-02 1,80E-02 1,80E-02 ND ND nropylanine 1,80E-02 1,86E-02 ND ND nropylanine 1,80E-02 1,86E-02 ND ND nropylanine 1,80E-02 1,86E-02 ND ND 1,80E-02 1,86E-02 ND ND 1,80E-02 1,86E-02 ND ND	navi alcohol	1,00E-02	1.80E-02		QN S	QN	QN	ON
Tropyletrer 1.00E-02 1.00E-02 ND	(2)-chloroiconrondlothor	1,00E-02	1,005-02		GN .	ON	QN	Q
Interpolar 1.80E-02 1.80E-02 1.80E-02 ND ND Interpolar 1.80E-02 1.86E-02 ND ND	activity and	4 000 00	1.00E-02		QN S	ON	Q	S
rropylamine 1.80E-02 1.86E-02 ND	nemylphenol	1.80E-02	1.86E-02	Q.	GN	QN	QN	QV
riopylamine 1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND	xacnioroemane	1.80E-02	1.86E-02	QN	QN	QN	ON	S
1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND ND 1.80E-02 ND	nitroso-di-n-propylamine	1.80E-02	1.86E-02	Q	QN	ND	QN	QN
1.80E-02 1.86E-02 ND ND 1.80E-02 1.86E-02 ND	nethylphenol	1.80E-02	1.86E-02	Q	QN	QN	S	ND
1.80E-02 1.86E-02 ND ND	robenzene	1.80E-02	1.86E-02	S	Q	QN	QN	ON
	phorone	1.80E-02	1.86E-02	S	Q	ND	QN	S
1.86E-02 ND ND	itrophenol	1,80E-02	1.86E-02	S	QN	QN	QN	GN

Table B-2: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 200 meter location

	Cartridge	Cartridge, .50 caliber, Blank, M1A1 (M2)	nk, M1A1 (M	2)	No. of rounds (I)		roimd
		Number of items tested =>	ns lested =>	strate of Transfer	release duration (t):	6	seconds
	Net Explos	Net Explosive Weight - N.E.W. (lbs.) =>	W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	6.870E-05 g/m // g/s	g/m³/(a/s)
	ATC	C Firing Test Results	SJIn				
	Average	Daily	Average	Average	Total Mass	Substance	Substance
	Actual	Backorolind	Fmiselnn	Adjusted	of Substance	Concentration	Emission
Compound	Concentration	Concentration	Factor (EF)	Factor	(orams///em)	(grams/m²)	Rate
	(mg/m³)	(mg/m³)	(lb/item)	(Ib/Ib NEW)		, onco	ER.
2,4-dimethylphenol	1.80E-02	1.86E-02	Q.	S	GN	CIN	· A
Bis(2-chloroethoxy)methane	1.80E-02	1.86E-02	ON.	NO NO	GN		O N
2,4-dichlorophenol	1.80E-02	1.86E-02	2	GN	GN		
1,2,4-trichlorobenzene	1.80E-02	1.86E-02	9	QN	QN	G S	QN QN
Naphthalene	9.31E-03	1.86E-02	3.06E-08	4.80E-06	1.388E-05	3 179F.10	A ROZE OR
4-cnioroaniine	1.80E-02	1.86E-02	QN	ND	QN	QN	ND
rexactiorobutaglene	1.80E-02	1.86E-02	QN	ON	QN	QN	SIN CN
4-cilloro-3-memyiphenoi	1.80E-02	1.86E-02	QN	DN	QN	QN.	GN
Z-memiyinapinalene	1.80E-02	1.86E-02	Q	ON	ON	QN	CN
riexaciliorocyclopentadiene	1.80E-02	1.86E-02	QN	QN	QN	9	GN
2,4,0-trichiorophenol	1.80E-02	1.86E-02	ON	ON	QN	CN	
2.44,3-tricilloroprienoi	1.80E-02	1.86E-02	S	ON	QN	S	CN
2 pitropulino	1.80E-02	1.86E-02	Q	NO	QN	QN	N ON
Acanaphthylona	1.80E-02	1.86E-02	S	ND	QN	GN	QN
Dimethylphthalate	1.80E-02	1.86E-02	2	ND	ON	N ON	QN
2.6-dinitrotoliane	1.80E-02	1.86E-02	2	QN	QN	QN	QN
Acenaphthene	1.80E-02	1.00E-UZ	Q Z		QN	QN	QN
3-nitroaniline	3.60E-02	3.71E-02	ON CIN	S S	ON	2	ON
2,4-dinitrophenol	3.60E-02	3.71E-02	2 2	2 2	ON	ON	QN
Dibenzofuran .	1.80E-02	1.86F-02	CN	QN	GN	ON	ON
2,4-dinitrotoluene	1.80E-02	1.86F-02			ON ON	ON!	S
4-nitrophenol	3.60E-02	3.71F-02		2 2	ON ON	ON	ON
Fluorene	1.80E-02	1.86F-02	2 2		ON CA	QN :	QN
4-chlorophenyl-phenylether	1.80E-02	1 86E-02	Q			CN	QN
Diethylphthalate	1.80E-02	1 86F-02		2 2		QN	Q
4-nitroaniline	3.60E-02	3.71E-02	2 8		ON	QN	QN
4,6-dinitro-2-methylphenol	3.60E-02	3.71E-02	CIN			ON	QN
Person whiters is real assessmental with constructing the construction of the construc		T		2	ND ON	GN	QN

	Cartridge	Cartridge, .50 callber, Blank, M1A1 (M2)	ink, M1A1 (M	2) (6, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,	No. of rounds (I)		1 philips
		Number of Itam's tasted =>	ms tested =>	7.00	release duration (t):		speonde
	Net Explos	Net Explosive Weight - N.E.W. (lbs.) #>	W. (lbs.) =>	6,37E-03	Unit Concentration (UC):	8,870E.05 q/m ³ /(q/s	(a/m)/(a/s)
		ATC Firing Test Results	ults				
	Average	Dally	Average	Average	Total Mass	Substance	Substance
	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emilled	(grams/m³)	Z Z
Compound	Concentration	Concentration	Factor (EF)	Factor	(grams/flem)		(a/ilem)/sec
	(mg/m³)	(mg/m³)	(lb/item)	(Ib/Ib NEW)		CONC	ER
N-nitrosodiphenylamine(1)	1.80E-02	1.86E-02	Q	QN	QN	QN	CN
4-bromophenyl-phenylether	1.80E-02	1.86E-02	QN	QN N	QN	QN	CN
Hexachlorobenzene	1.80E-02	1.86E-02	QN	Q	ON	ON	QN
Pentachlorophenol	3.60E-02	3.71E-02	GN	QN	QN	ND	CN
Phenanthrene	1.80E-02	1.86E-02	QN	QN	ND	QN	GN
Anthracene	1.80E-02	1.86E-02	QN	QN	ND	ON	QN
Di-n-butylphthalate	1.80E-02	1.86E-02	QN	QN ON	· QN	QN	CN
Fluoranthene	1.80E-02	1.86E-02	QN	QN	QN	QN	S
Pyrene	1.80E-02	1.86E-02	QN	QN	ON	ON	GN
Butylbenzylphthalate	1,80E-02	1.86E-02	QN .	ND	ND	ON	CN
Benzo(a)anthracene	1.80E-02	1.86E-02	· QN	QN	ND	NO.	QN
Chrysene	1.80E-02	1.86E-02	QN	QN	QN	QN	QN
3,3-dichlorobenzidine	1.80E-02	1.86E-02	QN	ND	QN	QN	ON ON
Bis(2-ethylhexyl)phthalate	3.95E-01	7.79E-01	DN	ND	QN	QN.	QN
UI-n-octylphthalate	1.80E-02	1.86E-02	QN	ND	QN	ON	QN
benzo(b)nuoranmene	1.80E-02	1.86E-02	Q	ND	ND	S	QN
Benzo(K)fluoranthene	1.80E-02	1.86E-02	Q	ND	QN	ON	Q.
Benzo(a)pyrene	1.80E-02	1.86E-02	Q	QN	QN	ND	S
Indeno(1,2,3-cd)pyrene	1.80E-02	1.86E-02	· Q	QN	ND	QN	ON
Diberiz(a,n)antinacene	1.80E-02	1.86E-02	ND	Q	ON	S	QN
penzo(g,n,l)perylene	1.80E-02	1.86E-02	Q Q	ND	QN .	Q	ON
SVUC Tentatively Identified Compounds (TICs)	pounds (TICs)						
10-13 (PAHS)							
Naphthalene	6.39E-03	2.60E-03	1.36E-08	2.14E-06	6.178E-06	1.415E-10	2.059E-08
Acenaphthylene	1.60E-04	1.86E-05	5.36E-10	8.42E-08	2.433E-07	5.571E-12	8 110E-08
Acenaphthene	3.87E-05	2.23E-05	6.32E-11	9.92E-09	2.867E-08	6.566E-13	9 557F-09
Fluorene	4.93E-05	1.86E-05	1.65E-10	2.59E-08	7.476E-08	1.712E-12	2 492F-08
Phenanthrene	8.79E-05	5.19E-05	1.40E-10	2.20E-08	6.371E-08	1.459E-12	2.124E-08
					. T) · H

M1A1data_200m.xls

1/18/01

Table B-2: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 200 meter location

	Cartridg	Cartridge, 50 caliber, Blank, M1A1 (M2)	ank, MIA1 (M	2)	No. of rounds (I)		1 Iround
		Number of Items fested =>	ms tested =>		release duration (t):	8	seconds
	Net Explos	sive Weight - N.E.W. (lbs.)	.W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	6.870E-05 q/m³/(q/s	d/m ³ /(q/s)
	ATC.	C Firing Test Results	sults				
	Average	Dally	Average	Average	Total Mass	Silbelance	Q. i. separation
74	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emitted	(grams/m³)	
Compound	Concentration	Concentration	Factor (EF)	Factor	(grams/nem)		// (a//lem//sec.
	(mg/m³)	(mgm3)	(Itp/item)	(Ib/Ib NEW)		CONC	
Anthracene	1.80E-05	1.86E-05	QN	S	GN	CIN	ON.
Fluoranthene	5,38E-05	1.86E-05	1.80E-10	2.82E-08	8.1565-08	1 868E 12	14D
Pyrene	5.12E-05	1.86E-05	1.71E-10	2.68E-08	7.7495-08	1 774E-12	2.7 (95-00
Benzo(a)anthracene	1.80E-05	1.86E-05	QN	QN	QN	ON ON	4.303E-U0
Chrysene	1.80E-05	1.86E-05	S	QN	QN	GN CN	QN QN
Benzo(b)fluoranthene	1.80E-05	1.86E-05	QN	QN	QN	QN	CN CN
Benzo(k)fluoranthene	1.80E-05	1.86E-05	QN	QN	QN	QN	CN CN
Benzo(e)pyrene	1.80E-05	1.86E-05	Q	QN	QN	GN	GIN ON
Benzo(a)pyrene	1.80E-05	1.86E-05	Q	ON.	QN	GN	SIN
Indeno(1,2,3-cd)pyrene	1.80E-05	1.86E-05	Q	ON	QN	CN	ON
Ulbenz(a,h)anthracene	1.80E-05	1.86E-05	S	ON	QN	GN	Q Q
Genzo(g,h,i)perylene	1.80E-05	1.86E-05	Q	QN	ON	GN	CN CN
Dioxins and Furans							
2378-TCDD	4.95E-09	4.16E-09	S	ON	QN	QN CN	ND
12378-PECDD	2.97E-09	2.33E-09	QN	ON	QN		
123478-HXCDD	2.88E-09	2.17E-09	QN	QN	QN	QN	
1236/8-HXCDD	2.98E-09	2.21E-09	QN	ND	ON	QN	GN
123789-11ACDD 1934878 UDCDD	2.74E-09	2.06E-09	QN	QN	QN	ON	N NO
OCDD	4.84E-U9	3.73E-09	5.14E-15	8.06E-13	2.330E-12	5.335E-17	7.766E-13
9378 TONE	0,0/E-U8	4.43E-08	9.21E-14	1.45E-11	4.179E-11	9.569E-16	1.393E-11
49378 DECNE	2.06E-09	1.72E-09	Q	QN	ND	QN	QN
23.13-11-00F	Z.56E-09	2.09E-09	Q	ND	QN	ND ND	ND
400478 11VOPE	2.62E-09	2.13E-09	QN	ND	QN	QN	QN
400041 0-0004	1.72E-09	1.32E-09	Q	ND	QN	GN	QN
1230/8-HACDF	1.75E-09	1.32E-09	Q	ND	QN	· QN	QN
123769-HACDF	4.49E-09	3.45E-09	QN	QN	QN	QN	QN
4234678 UDCNE	1.92E-09	1.42E-09	QN	QN	QN	QN	QN
1234070-TIF-U.JF	1.42E-09	1.27E-09	9.82E-16	1.54E-13	4.456E-13	1.020E-17	1,485E-13

	Cartridge	Cartridge, .50 callber, Blank, M1A1 (M2)	nk, M1A1 (M	2)	No. of rounds (I)		Parity 4
		Number of items tested =>	ns tested =>		release duration (t):	6	speconds
	Net Explos	<pre>axplosive Weight - N.E.W. (lbs.) =></pre>	W. (lbs.) =>	6.37E-03	Unit Concentration (UC):	6.870E-05	6.870E-05 g/m 7(g/s)
	A(TC	ATC Firing Test Results	ults	40 40			
	Average	Dally	Average	Average	Total Mass	Substance	Substance
	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Emission
	Actual	Background	Emission	Emission	Emitted	(grams/m³)	Bala
Compound	Concentration	Concentration	Factor (EF)	Factor	(grāms/item)		(a/illami)/sec
	(mg/m ₃)	(mg/m3)	(lb/llem)	(Ib/Ib NEW)		9 N 00	ER
1234789-HPCDF	2.21E-09	2.54E-09	S	ON	ND	CN	CN
OCDF	4.46E-09	3.65E-09	1.49E-14	2.34E-12	6.761E-12	1.548F-16	2 25AE-12
Energetics	e inv						71 71 71 71 71 71 71
Nitrobenzene	3.51E-03	NA	S	ND	QN	GN	S
2-Nitrotoluene	3.51E-03	ΑN	QN	QN	QN	GN	CN
3-Nitrotoluene	3,51E-03	NA	QN	QN	QN	S	S
4-Nitrotoluene	3.51E-03	NA	Q	QN	ON	CN	
Nitroglycerine	3.51E-03	NA	ND	QN	QN	QN.	SS
1,3-Dinitrobenzene	3.51E-03	NA	ON	ON	QN	QN	S
z,b-Uinitrotoluene	3.51E-03	NA	ND	QN	ND	QN	QN
2,4-Unitrotoluene	3.51E-03	NA NA	Q	ND	ON	QN	S
1,3,0-1 fillitrobenzene	3.51E-03	NA	QN	ND	QN	QN	QN
Z,4,0-1 rinitrotoluene	3.51E-03	NA	QN	QN	QN	ND	QN
A Amino 26 Dirik Addison	3.51E-03	AN	2	Q	QN	QN	QN
2. Amino 4. 6 Dinitrotolicae	3.51E-03	NA	Q	Q	ND	QN	ON
Z-Airin to-t, o-Dimit otolidene	3,51E-03	VA V	2	Q	ON.	S	QN
I GII YI	3.51E-03	NA	Q	QN	QN	QN	QN
VINIT	7.0ZE-03	NA	Q	2	QN	N ON	CN
Pentaerythritoitetranitrate	7.02E-03	NA	QN	Q	ON	QN	S
Dibutyl phthalate	1.76E-01	NA	Q	Q.	QN	GN	CN
Dioctyl phthalate	1.76E-01	NA	QN	GN	QN	CN	GN CN
Diphenylamine	8.78E-02	NA	QN	QN	ON	QN.	CN
Footnotes:							

Table B-2: Air Modeling Output Data for the Cartridge, .50 Caliber Blank, M1A1 (M2) - 200 meter location

'ATC = Aberdeen Test Center (for additional information on the data, refer to the Firing Point Emission Study) NA = Not Applicable ND = Not Detected

M1A1data_200m.xls

APPENDIX C

HEALTH-BASED SCREENING LEVELS AND ACUTE TOXICITY VALUES

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

		Region 9	Toxicity	Roulon 3	Tovirihi			10.00			
Compound	CAS#	PRG	Endpoint	RBC	Endpoint	HBSL	ERPG	Ī	AEGL	Source	E
		(m/grl)	(c or nc)	(mg/m ₃)	(c or nc)	(Lid/m³)	(finalm3)	(Ind/m3)	(110/013)		
Permanent Gases					The second secon		15.0) III Mark	/ Imfadi		(m/grl)
Ammonia (NH ₃)	7664-41-7	1.04E+02	nc	104.39	ü	1 04E+03	1 75E.104	1 761 104			
Carbon Dioxide (CO ₂)	124-38-9	NA		NA		7 - C	NIA TOTA	1.7 3E 104	NA .	ונ	1.75E+04
Carbon Monoxide (CO)	630-08-0	1.00E+04	nc	NAN		1 005		5.40E+07	VΝ	L	5.40E+07
Oxides of Nitrogen (as NO)	10102-43-9	1.00E+02	nc	AN		1,00E+04	3.	2.28E+05	Y Y	ш	2.30E+05
Sulfur Dioxide (SO ₂)	7446-09-5	8.00E+01	nc nc	Q V		1.00E+02		3.08E+04	YN N	⊢	3.08E+04
Acid Gases			2	5		0.00E+U1	7.89E+02	7.86E+02	NA	ш	7.89E+02
Hydrogen fluoride	7664-39-3	NA		AN		MA	1 ROE 103	4 041 .00			
Hydrogen chloride	7647-01-0	2.08E+01	nc	2.08F+01	24	2 08E 101	4 EOE 103	1.045.103	NA :	ш	1.60E+03
Hydrogen bromide	10035-10-6	ΑN		NA	2	AIA NA	4.30E+03	4.47 = +03	NA:	ш	4.50E+03
Nitric Acid	7697-37-2	MA		NA		V2.	XX.	9.93⊏+03	¥		9.93E+03
Phosphoric acid	7664-38-2	1.04E+01	ne	1 08E±01	00	1VA 4 CAT : DA	NA S	2.58E+03	1.30E+03	¥	1.30E+03
Suffuric Acid	7664-93-9	NA			2	1.046.401	NA C	3.00E+03	¥	H	3.00E+03
Cyanide						NA	Z.UUE+03	2.00E+03	¥	ш	2.00E+03
Particulate Cyanide	57-12-5	NA		7.30F+04	٥	7 305104	4	100			
Hydrogen Cyanide	74-90-8	3 13F+00	24	3 445.00	2 5	7.30E.TU	T	5.00E+03	Ϋ́	T	5.00E+03
Particulates			2	0.14E+00	2	3.13E+00	AN	5.17E+03	¥	_	5.17E+03
Total Suspended Particulate	12789-66-1	5 00F±01	200	444		1					
PM ₁₀		5 00E+01	2 9	¥ V		5.00E+01	YN.	¥N	NA A		ΝA
PM _{2.5}		1 50E+04	2 6	Y 52		5.00E+01	NA NA	ΑΝ	NA		NA
Metals		0.1	2	W.		1.50E+01	Ϋ́	¥	¥		Y.
Aluminum	7429-90-5	5.11E+00	nc	3 655+00	20	K 44ELOO	914	70000			
Antimony	7440-36-0	ΑN		1.46E+00	2 2	1 48E+00	2 2	3.00E+04	¥.		3.00E+04
Arsenic	7440-38-2	4.47E-04	S	4.15E-04	2 0	4 47E.04	<u> </u>	1.305+03	¥ S	-	1.50E+03
Barium	7440-39-3	5.21E-01	nc	5.11E-01	2	5 24E 04	X	3.00E+01	NA S		3.00E+01
Beryllium	7440-41-7	8.00E-04	c	7 45E-04	T	0 200	5 5	1.50E+U3	NA	-	1.50E+03
Cadmium	7440-43-9	1.07E-03	O	9 94F-04	T	1 07E 03	¥ 2	3.00E+00	¥:		5.00E+00
Calcium	7440-70-2	NA		NIA	T	20-1-07	T	3.00E+01	Y Y	-	3.00E+01
Chromium	7440-47-3		c	1 535 04	ه اد	NA POST	¥ :	3.00E+04	¥	⊢	3.00E+04
Cobalt	7440-48-4	NA		2 205.402	ا د	1.33E-04	1	1.50E+03	≨	-	1.50E+03
Copper	7440-50-8	NA		4.40E+02	2 4	Z.ZUE-+UZ		6.00E+01	¥	<u>.</u>	6.00E+01
Lead	7439-92-1	1.50F+00	20	1.#OE+UZ	2	1.46E+UZ		3.00E+03	¥	F	3.00E+03
Magnesium	7439-95-4	NA A	2	V		1.50E+00	Ī	1.50E+02	ΑN	F	1.50E+02
Laboratoria de la constitució	1 00 001	T 1/81		NA		NA	NA NA	3.00E+04	– ¥	-	3.00E+04

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

Compound	# 67 P	Region 9 PRG	Toxicity Endpoint	Region 3 RBC	Toxicity Endocint	E E	20 00 11		Ç		
	3	(_c w/gr/)	(c or nc)	(c _m /fbrl)	(c or nc)	(mg/m³)	(mg/m³)	(Lid/m³)	(ua/m³)	(T or E)	> \(\)
Manganese	7439-96-5	5,11E-02	nc	5.22E-02	มูเ	5 11E.02	ΔM	3 00 = 103	AIA		(111)
Nickel	7440-02-0	AN		7.30E+01	JC	7.30E+01	AN	3.005.103	ZZ V	- -	3,00E+03
Selenium	7782-49-2	NA		1.83E+01	nc	1.83E+01	NA	6.00E+02	NA	-	3.00E+03
Silver	7740-22-4	NA		1.83E+01	nc	1.83E+01	¥	3.00E+02	NA	-	3 005 102
Inallium	7440-28-0	AA		2.56E-01	26	2.56E-01	NA	3.00E+02	NA	-	3.00E.102
Vanadium	7440-62-2	NA		2,56E+01	nc	2.56E+01	W	1.50E+02	NA	- 1-	4 FOE 102
Zinc	7440-66-6	NA		1.10E+03	nc	1.10E+03	NAN.	3 00E+04	NA	- -	2.00E+02
TO-11 Carbonyls								2001	ZN.	-	3.00E+04
Formaldehyde	20-00-0	1.48E-01	၁	1.39E-01	0	1.48E-01	1.23E+03	1.23E+03	NA	ш	1 23E.103
Acetaldenyde	75-07-0	8.73E-01	ပ	8.13E-01	υ	8.73E-01	1.80E+04		NA	ı	1 805+04
Acetone	67-64-1	3.65E+02	၁င	3.65E+02	ည	3.65E+02	NA		S S	J -	2 37E + 0R
Acroiein	107-02-8	2.09E-02	nc	2.08E-02	nc	2.09E-02	2.30E+02	2.29E+02	NA	. 4	2 30E+02
Proprionaldenyde	123-38-6	¥.		AN		NA	NA	7.50E+04	NA	<u>.</u>	7 505-104
Crotonaldenyde	4170-30-3	3.54E-03	ပ	3.30E-03	၁	3.54E-03	5.72E+03	5.72E+03	NA	- w	5 72F-103
pulyraidenlyde	123-72-8	Ϋ́		ΑΝ		VΑ	MA	7.38E+04	NA		7 38E+04
benzaldenyde	100-52-7	3.65E+02	ПС	3.65E+02	nc	3.65E+02	₩	1.50E+04	NA		1 50F+04
Isovaleraldenyde	590-86-3	ΑΝ		NA		N.	NA NA	N N	AN.		NA
valeraldenyde	110-62-3	ΔN		NA		NA	MA	¥	¥		AN
o,iii,p-i olualdenyde	1334-78-7	ΑΝ		NA		ΑN	AN	ΑN	×		AN
nexaluenyde	66-25-1	Ϋ́		NA		ΑN	M	AN	M		AN
4,5-Ulmethylbenzaldehyde	5779-94-2	¥		NA		NA	¥	NA	¥		NA
VOCS											
Propene	115-07-1	NA		NA	11)	AN.	¥	NA	N N		MA
Dichiorodiffuoromethane	75-71-8	2.09E+02	22	1.83E+02	nc	2.09E+02	NA	1.48E+07		┢	1 48F+07
From 114	9-64-6/	5.11E+04	ည	5.11E+04	ဥ	5.11E+04	NA	4.41E+06			4.41E+06
Plotomothans	7-41-0/	¥N.		¥.		NA	NA	2.10E+07		F	2.10E+07
Vind Charles	74-87-3	1.07E+00	ပ	1.79E+00	ပ	1.07E+00	NA	2.06E+05		F	2,06E+05
Virgi Ciliolide	/3-UI-4	2.20E-02	ပ	2.10E-02	၁	2.20E-02	N A	1.28E+04		F	1 28F+04
l,3-butaulerie	106-99-0	3.74E-03	υ	3.48E-03	.O	3.74E-03	2,20E+04	2.21E+04		T	2.20E+04
Oblomothers	74-83-9	5.21E+00	20	5.11E+00	nc	5.21E+00	AA	5.82E+04		L	5.82E+04
Olabbaroffi and	6-00-9	2.32E+00	nc	NA A		2.32E+00	AA	2.64E+06		T	2.64E+06
Trichloroffinoromethana	75.60.4	2.09E+02	ည	1.83E+02	nc	2.09E+02	ΝA	1.48E+07		-	1.48E+07
Pantana	13-08-4	/.30E+0Z	20	7.30E+02	nc	7.30E+02	¥	2.81E+06		Ŀ	2.81E+06
	0-99-601	NA		NA N		¥	¥	1.80E+06		T	1.80E+06

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

		Region 9	Toxicity	Region 3	Toxicity		3				
Compound	CAS#	PRG	Endpoint	RBC	Endpoint	HBSL	ERPG	TEEL	AEGL	Source	ATA
*		(m/Brl)	(c or nc)	(m/gr)	(c or nc)	(mg/m³)	(ua/m³)	(ma/m³)	(IIII)		
Acrolein	107-02-8	2.09E-02	nc	2 ORF-02	200	2 005 00	000.000	1 C.J.	Langua		(mg/m)
1,1-Dichloroethene	75-35-4	5.21E+02	nc	5 11F+02	2 6	5.03E-02	Z,30E+0Z	2.29E+02		U	2.30E+02
Freon 113	76-13-1	3.13E+04	nc	3 14E+04	2 2	3 495,04	NA S	7.92E+04			7.92E+04
Acetone	67-64-1	3.65E+02) l	3 65E+02	2 2	9.13E+04	¥.	9.58E+06			9.58E+06
Methyl lodide	74-88-4	AN	2	S.O.S. TOZ.	2	3.00=+02	NA	2.37E+06		Т	2.37E+06
Carbon Disulfide	75-15-0	7.30E+02	nc	7 305-102	4	NA 7 20F : 00	145000	1.45E+05		ш	1.45E+05
Acetonitrile	75-05-8	6 20E+01	2 2	A 24E 104	2	7.30E+0Z	¥.	3.11E+04		-	3.11E+04
3-Chloropropene	107-05-1	1 04E+00	2 2	0.215+01	၁၂	6.20E+01	ΝΑ	1.01E+05		 -	1.01E+05
Methylene Chloride	75-09-2	4.09F+00	2	3 705 100		1.04E+00	9.39E+03	9.39E+03		ш	9.39E+03
tert-Butyl Alcohol	75-65-0	NA	>	0.7 3L 100	اد	4.081:+00	000969	6.94E+05		ш	6.96E+05
Acrylonitrile	107-13-1	2 R3E_02		2 64 17 00		NA S		4.55E+05		Ь	4.55E+05
trans-1,2-Dichloroethene	158.80.E	7 305 104	ָן ני	2.01E-02	O	2.83E-02	21700	2.17E+04		ш	2.17E+04
Methyl t-Butyl Ether	1634 04 4	7 435 100	nc	7.30E+01	ဍ	7.30E+01		4.95E+04		L	4.95F+04
Hexane	1034-04-4	3.13E+U3	nc	3.13E+03	nc	3.13E+03	NA	4.32E+05		1	4 32E+05
1 1-Dichloroethane	110-04-3	Z.09E+0Z	22	2.08E+02	nc	2.09E+02	¥	5.28E+05		L	5 28E+05
Vinyl Acetate	13-34-3	5.21E+02	20	5.11E+02	nc	5.21E+02	¥	1.21E+06		-	1 24 - 108
cis-1 2 Dioplanation	108-05-4	2.09E+02	nc	2.08E+02	nc	2.09E+02	19150	1.76F+04		- 4	4 02 1 1 04
2 Butanana	156-59-2	3.65E+01	nc	3.65E+01	nc	3.65E+01	¥	7 92F+05		<u> </u>	1.92E+04
Ethat A cata	78-93-3	1.04E+03	nc	1.04E+03	nc	1.04E+03	NA	8 RSE+05		- -	7.92E+05
Ethyl Acetate	141-78-6	3.29E+03	nc	3.29E+03	nc	3.29E+03	NA	1 44E 100		- +	8.85=+05
Wetnyl Acrylate	96-33-3	1.10E+02	nc	1.10E+02	nc	1 10F+02	S V	NA PLACE		-	1.44E+06
Chloroform	67-66-3	8.35E-02	O	7.73E-02	2 0	8 35E-02	S S	NA 0 76F 0			Y V
1,1,1-Trichloroethane	71-55-6	1.04E+03	nc	2 30F±03	200	4 OAF 100	20.77	9.70E+U3			9.76E+03
Carbon Tetrachloride	56-23-5	1,28E-01		1 18E-01	2 0	1.04E+U3	1.84E+U6	1.91E+06		ш	1.94E+06
1,2-Dichloroethane	107-06-2	7.39E-02) c	G ARE-02	<u>، ا</u> د	1.40E-U1	1.28E+U5	1.26E+05		ш	1.28E+05
Benzene	71-43-2	2.49E-01	0	2 185-01		7.39E-02	NA C	8.08E+03		_	8.08E+03
Isooctane (2,2,4-trimethylpentane)	540-84-1	NA	>	AIA NIA	اد	2.48E-U1	1.56E+05	1.60E+05		Ш	1.56E+05
Heptane	142-82-5	NA				¥Z.	1	3.50E+05		<u></u>	3.50E+05
Trichloroethane	71-55-6	1 04E±03		NA COLLOGIC		AN .		1.80E+06		F	1.80E+06
Ethyl Acrylate	140.88.6	1 400 04	2	Z.30E+03	2	1.04E+03	90-	1.91E+06		Ш	1.94E+06
1.2-Dichloropropane	78 87 6	1.40E-01	o l	NA		1.40E-01		6.14E+04		T	6.14E+04
Methyl Methacrylate	C-10-01	3.09E-02	1	9.21E-02	υ	9.89E-02	ΑA	5.08E+05		 -	5.08F+05
Dibromomethene	0-20-00	7.30E+02		7.30E+02	nc	7.30E+02	¥	4.09E+05		-	4 00E+0E
1 4-Dioxana	4-85-3	3.655-401	2	3.65E+01	nc	3.65E+01	ΑN	2.50E+05		T	2 50F+05
Bromodichloromethene	1-18-621	6.11E-01	ပ	5.69E-01	ပ	6.11E-01	¥	9.00E+04		Ţ	9 00E+04
DI DI INDIANI DI LE INDIANI LE	15-27-4	1.08E-01	ပ	1.01E-01	ပ	1.08E-01	T	4.00F+03		+	9.00E+04
							1	100.300		-	4.00E+03

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

		Region 9	Toxicity	Region 3	Toxicity			7			
Compound	CAS#	PRG	Endpoint	RBC	Endpoint	HBSL	ERPG	TEEL	AEGL	Source	ATV
	, ,	(hg/m³)	(c or nc)	(hg/m³)	(c or nc)	(mg/m³)	(tug/m³)	(hg/m³)	(mg/m³)	(T or E)	Cug/m ₂
4-Methyl-2-Pentanone	108-10-1	8.34E+01	nc	7.30E+01	nc	8.34E+01	AN	3.075+05		ŀ	2 07E 10E
Toluene	108-88-3	4.02E+02	nc	4.16E+02	nc	4.02E+02	1.88E+05			- 11	1 88E.105
Octane	111-65-9	NA		¥		NA	NA N			-	NA
trans-1,3-Dichloropropene	10061-02-6	5.17E-02	ပ	4.82E-02	၁	5.17E-02	NA	¥			NA
Ethyl Methacrylate	97-63-2	3.29E+02	nc	3.29E+02	22	3.29E+02	NA	¥			NA
1,1,2-Trichloroethane	79-00-5	1.20E-01	၁	1.12E-01	ပ	1.20E-01	AN	1.64E+05		-	1 64E+05
Tetrachloroethene	127-18-4	3.31E+00	၁	3.13E+00	ပ	3.31E+00	NA	6.78E+05		- -	6 78F+05
Z-Hexanone	591-78-6	NA		5.11E+00	nc	5.11E+00	NA	4.09E+04		- -	4.09F+04
Ulbromochloromethane	124-48-1	8.00E-02	၁	7.45E-02	၁	8.00E-02	NA	6.00E+03		F	6.00E+03
1,2-Ulbromoethane	106-93-4	8.73E-03	C	8.24E-03	ပ	8.73E-03	ΑN	1.54E+05		F	1.54F+05
Chlorobenzene	108-90-7	6.21E+01	nc	6.21E+01	2	6.21E+01	NA	1.38E+05		-	1.38F+05
1,1,1,2-1etrachloroethane	630-20-6	2.60E-01	ပ	2.41E-01	ပ	2,60E-01	ΑN	5.15E+04		L	5.15E+04
Emylbenzene	100-41-4	1.06E+03	nc	1.06E+03	nc	1.06E+03	ΑN	5.43E+05		L	5 43F+05
m&p-Xylene	108-38-3 106-42-3	7.30E+02	nc	7.30E+03	nc	7.30E+02	NA	6.51E+05		<u>+</u>	6.51E+05
o-Xylene	95-47-6	7.30E+02	UC	7.30E+03	nc	7.30E+02	¥.	6.51E+05		1	8 51E TOE
Styrene	100-42-5	1.06E+03	ည	1.04E+03	nc	1.06E+03	2.13E+05	2.13E+05		- 1	2 135.105
Bromoform	75-25-2	1.75E+00	ပ	1.61E+00	S	1.75E+00	NA	6.20E+03		J -	6.10E-03
Cumene	98-82-8	4.02E+02	nic	4.02E+02	nc	4.02E+02	¥	2.46E+05		-	2.46E+05
1,1,2,2-1 etrachloroethane	79-34-5	3.31E-02	ပ	3.13E-02	C	3.31E-02	ΥN	2.06E+04		F	2.06E+04
1,2,3-1 richloropropane	96-18-4	9.61E-04	٥	3.13E-03	၁	9.61E-04	NA	6.03E+04		F	6.03E+04
Bromobenzene	108-86-1	1.04E+01	nc	¥		1.04E+01	N A	4.82E+04		F	4.82E+04
4-Ethylioluene	622-96-8	¥		¥		NA	NA	1.25E+05		L	1.25E+05
1,5,5-1 Ilmethylbenzene	108-67-8	6.21E+00	ည	6.21E+00	JUC	6.21E+00	NA	3.68E+05		F	3.68E+05
Apria Melliyi Siylefle	98-83-9	2.56E+02	п С	2.56E+02	22	2.56E+02	NA	NA			ΑN
1.2.++ Hilletilyibelizerie	95-63-6	6.21E+00	၁ပ	6.21E+00	nc	6.21E+00	NA	1.80E+05		Ţ	1.80E+05
1,3-Dichlorobenzene	541-73-1	3.29E+00	2	3.29E+00	nc	3.29E+00	NA	3.61E+04		_	3.61E+04
i,4-Dictiloloberizerie	/-9b-9n1	3.06E-01	ပ	2.85E-01	ပ	3.06E-01		6.61E+05	*	-	6.61E+05
Benzyl Chloride	100-44-7	3.96E-02	ပ	3.68E-02	၁		5.20E+03	5.17E+03		ш	5.20E+03
I,z-Dichlobenzene	95-50-1	2.09E+02	၁ပ	3.29E+01	ည	2.09E+02	NA	3.01E+05		F	3.01E+05
riexachiorethane	67-72-1	4.80E-01	O	4.47E-01	ပ	4.80E-01	NA	2.90E+04		L	2.90E+04
1, z, 4-1 richiorobenzene	120-82-1	2.08E+02	nc	2.08E+02	nc	2.08E+02	NA	3.71E+04		L	3.71E+04
nexaciilorobutadiene	87-68-3	8.73E-02	S	8.03E-02	ပ	8.73E-02	3.21E+04	3.20E+04		Ш	3.21E+04

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

	100	Region 9	Toxicity	Region 3	Toxicity		100	1.7	Sept.		
Compound	CAS#	PRG	Endpoint	RBC	Endpoint	HBSL	ERPG	The state of the s	AFGI	Source	Ì
		(fug/m³)	(cornc)	(tığı/m ₃)	(c of nc)	(mg/m _s)	(Lig/m³)	(tig/m³)	(Ind/m3)	T or E	6.
Hydrocarbons					310 N. C.	1865 C	7,		(M.S.)		(hg/m)
Methane	74-82-8	Ϋ́		NA		NA	MA	3 305.408		ł	
Ethylene	74-85-1	ΑN		NA		NA	NA	4 80E 40E		-	3.30E+06
Acetylene	74-86-2	NA		NA		NA	NA	*.OUE TOO		-	4.60E+05
Ethane	74-84-0	ΝA		NA	***************************************	VIV	S S	V. V			YA V
Propylene	115-07-1	NA		NA		V V	AN A	¥ S			¥
Propane	74-98-6	NA		NA		S N	NA NA	NA 201.00			¥
Propyne (methyl acetylene)	74-99-7	NA		MA		NA	Y	3.785+06		-	3.78E+06
Isobutane	75-28-5	AN		WA		NAN	AM	O KOETOR		- -	2.79E+06
1-Butene/Isobutylene (115-11-7)	106-98-9	NA		ΑN		NA	NA	8.02L 103		- -	9.52E+05
1,3-Butadiene/butane	106-99-0	3.74E-03	၁	3.48E-03	3	3.74E-03	2.20F+04	2.07 E.100		- 1	6.8/E+06
cis-butene	25167-67-3	NA		¥		AN		1 72F+04	VIV	U F	4.20E+04
I-Butyne	107-00-6	¥		ΑN		AN	VΝ	512	5	-	1.72E+04
trans-Butene	25167-67-3	NA		NA	***************************************	NA	AN	1 72F±04	VIV	1	NA 197
Z-Butyne (crotonylene)	503-17-3	ΑN		ΑN		NA	NA	NIA CIT	5	-	1./2E+04
n-Pentane	109-66-0	NA		NA		NAN MAN	NA N	1 80E 108		-	NA
n-Hexane	110-54-3	2.10E+02	nc	2.08E+02	nc	2.10E+02	AN	5 28E-106		- -	1.80E+06
SVOCs								0.402.103		-	5.28E+05
n-nitrosodimethylamine	62-75-9	1.37E-04	O	1.23E-04	3	1.37F-04	ΔN	2 605.02		}	
bis(2-chloroethyl)ether	111-44-4	5.82E-03	o	5.69E-03	٥	5 82E-03		6.30E+03		-	2.50E+03
phenol	108-95-2	2.19E+03	nc	2.19E+03	nc	2 19F+03	NA	2 85E 104		- +	5.85E+04
2-chlorophenol	8-22-96	1.83E+01	nc	1,83E+01	200	1 83E+01	VIV	5.00E+04		-	3.85E+04
1,3-Dichlorobenzene	541-73-1	3,29E+00	nc	3.29E+00	20	3.29F+00	V	3 645.04		- -	5.25E+03
1,4-dichlorobenzene	106-46-7	3.06E-01	ပ	2.85E-01	0	3.06E-01	N	6.61E+05		- -	3.61E+04
I,z-uiciiloi openzene	95-50-1	2.09E+02	nc	3.29E+01	nc	2.09E+02	NA NA	3.01E+05		- -	3.01E+03
bin(2 oblication in the	100-51-6	1.10E+03	ည	1.10E+03	nc	1.10E+03	Π	5.53E+04		- -	5.01E+03
2 mothubbasi	108-60-1	1.92E-01	O	1.79E-01	ບ	1.92E-01		6.99E+04		- -	6 09E+04
hovochlosothess	95-48-7	1.83E+02	20	1.83E+02	nc	1.83E+02	AN AN	¥			NA
nevaciiolocularie	67-72-1	4.80E-01	ပ	4.47E-01	ပ	4.80E-01	¥	2.90E+04		-	2 00 5 404
A mothylahonal	621-64-7	9.61E-04	ပ	8.94E-04	ပ	9.61E-04	AN	2.00E+02		- -	2 00E+03
nitrokonzono	106-44-5	1.83E+02	nc	1.83E+02	nc	1.83E+02	ΑN	¥N		-	NA NA
isophorona	98-95-3	2.09E+00	2	2.19E+00	20	2.09E+00	NA	1.51E+04		F	1.51E+04
2-nitronband	1-80-07	7.08E+00	ပ	6.59E+00	ပ	7.08E+00	NA	2.83E+04		F	2.83F+04
	0-07-90	NA NA		¥		NA	NA	NA A			AN AN
								**************************************	-		- ::

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

		Region 9	Toxicity	Region 3	Toxicity				*** *** ***		
Compound	CAS#	PRG	Endpoint	RBC	Endpoint	HBSL	ERPG	TEEL	AEGL	Source	2
		(hg/m³)	(c or nc)	(hg/m³)	(c or nc)	(mg/m³)	(mg/m ₃)	(ng/m³)	(mg/m ₃)	(T or E)	(io/m ³)
2,4-dimethylphenol	105-67-9	7.30E+01	nc	7.30E+01	100	7.30E+01	NA	NA	1897 Tr 1807		NIA NIA
bis(2-chloroethoxy)methane	111-91-1	NA		NA		NA	¥	NA			Z VIV
2,4-dichlorophenol	120-83-2	1.10E+01	nc	1.10E+01	22	1.10E+01	¥	3.00E+04		F	3 00E+04
1,2,4-trichlorobenzene	120-82-1	2.08E+02	nc	2.08E+02	nc	2.08E+02	NA	3.71E+04		- -	3 715 404
naphthalene	91-20-3	3.13E+00	nc	3.29E+00	nc	3.13E+00	NA	7.86E+04		- -	7 88E-404
4-chloroaniline	106-47-8	1.46E+01	nc	1.46E+01	20	1.46E+01	NA	3.00E+04		- -	3.00E+04
nexacniorobutadiene	87-68-3	8.62E-02	ပ	8.03E-02	ပ	8.62E-02	3.21E+04	3.20E+04		 	3.27E+04
4-cnioro-3-metnylphenol	59-50-7	ΔN		NA		ΑN	NA	2.00E+04			2 00 = +04
Z-methylnaphthalene	91-57-6	ΝΑ		7.30E+01	nc	7,30E+01	NA	2.00E+04		- -	2 00E+04
nexachiorocyclopentadiene	77-47-4	7.30E-02	nc	7.30E-02	ല	7.30E-02	ΑN	2.23E+02		Ŀ	2 23E±02
2,4,0-trichiorophenol	88-06-2	1.10E+02	nc	1.10E+02	nc	1.10E+02	NA	3.00E+04			3 00F+04
2 allocate Life in a second se	95-95-4	3.65E+02	nc	3.65E+02	nc	3.65E+02	ΑN	3.00E+04		·	3.00F+04
z-cnioronapmmalene	91-58-7	2.92E+02	nc	2.92E+02	nc	2.92E+02	¥	6.00E+02		- -	6 00F+02
According	88-74-4	2.09E-01	nc	2.08E-01	nc	2.09E-01	₹	ΑŅ			NA
Acenaphinylene	208-96-8	ΑN		NA		NA	¥	2.00E+02			2 00F±02
Griff the control of	131-11-3	3.65E+04	nc	3.65E+04	2	3.65E+04	¥	1.50E+04		- -	1 50E+04
z,o-umirrotojuene	606-20-2	3.65E+00	ဥ	3.65E+00	nc	3.65E+00	¥.	6.00E+02		- -	6.00F+02
acellaphillene	83-32-9	2.19E+02	20	2.19E+02	nc	2.19E+02	¥	1.25E+03		F	1.25E+03
2-flittoshonol	99-09-2	ΑN		NA		W	¥	¥			NA
dispersolusion	21-28-5	7.30E-+00	2	7.30E+00	nc	7.30E+00	NA	7.50E+03		Ţ	7.50E+03
order and an analysis of a distratetions	132-64-9	1.46E+01	nc	1.46E+01	22	1.46E+01	NA	NA NA			N A
4.nitrophonol	121-14-2	7.30E+00	ဗ	7.30E+00	nc	7.30E+00	NA	6.00E+02			6.00E+02
Fliorena	1-70-001	2.92E+01	2	2.92E+01	2	2.92E+01	Ϋ́	3.00E+04		F	3.00E+04
4-chloronhenvl-nhenvlether	7005 70 0	1.40E+UZ	nc	1.46E+UZ	2	1.46E+02	¥	7.50E+04		H	7.50E+04
diethylohthalate	84 GG 2	NA 2 02E 102		NA		¥N	Ϋ́	ΑN			¥
4-nitroanilina	7-00-40	Z.3ZE+U3	JUC	Z.9ZE+03	20	2.92E+03	¥	1.50E+04		F	1.50E+04
4.6-dinitro-2-methylphenol	694 69 4	Y S		NA I		NA	≨	9.00E+03		F	9.00E+03
n-nitrosodinhenvlamine(1)	96 90 6	1 021 . 00		3.65E-01	2	3.65E-01	¥	5.00E+02		F	5.00E+02
4-hromonhand nhandother	00-20-00	1.375+00	၁	1.28E+00	S	1.37E+00	¥	NA			NA
hexachlorohenzene	101-03-3	NA 101		NA.		NA NA	NA N	NA			NA
nentachlorophonal	1-1/-011	4.18E-03	ပ	3.91E-03	0	4.18E-03	NA	7.50E+01		F	7.50E+01
phenanthrana	07-00-3	5.60E-02	O	5.22E-02	0	5.60E-02	NA	1.50E+03		L	1.50E+03
anthracene	120 49 7	14 40E 100		NA		¥		2.00E+03		F	2.00E+03
	1-71-071	1,100.+03	20	1.10E+03	<u>ا</u>	1.10E+03	NA	6.00E+03		F	6.00E+03

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

		Region 9	Toxicity	Radion 3	Taylelly	April 1985					
Compound	CAS#	PRG	Endpoint	RBC	Endpoint	HBSL	ERPG	眉	AEGL	Source	ATV.
		(hg/m³)	(c or nc)	(finging)	(c or nc)	(mg/m³)	(µg/m³)	(fig/m ²)	(Lid/m ³)	(TorE)	
di-n-butylphthalate	84-74-2	3.65E+02	nc	3.65E+02	nc	3.65E+02	NA	1 50E+04		. F	7 102
แนงรถเกอกอ	206-44-0	1.46E+02	nc	1.46E+02	nc	1.46E+02	NA	3.00F+01		- :-	1.30E+04
pyrche	129-00-0	1.10E+02	ou	1.10E+02	nc	1.10E+02	NA	1 50F+04		- -	3.00E+01
butylbenzylphthalate	85-68-7	7.30E+02	nc	7.30E+02	nc	7.30E+02	NA	5 00F+05		- i-	1,30E+04
benzo(a)anthracene	56-55-3	2.17E-02	၁	8.58E-03	0	2.17E-02	NA NA	6.00F+02		- -	3.00E+03
Chrysene	218-01-9	2.17E+00	O	8.58E-01	O	2.17E+00	NA	2 00F + 02			0.00E+02
3,3-dichlorobenzidine	91-94-1	1.50E-02	၁	1.39E-02	0	1.50E-02	¥	6.21E+03			2.00E+02
DIS(Z-etriylinexyl)phthalate	117-81-7	4.80E-01	ပ	4.47E-01	O	4.80E-01	AN	1 00F+04		- -	4 00 1 1 0 4
di-n-octylphthalate	117-84-0	7.30E+01	nc	7.30E+01	JIC.	7.30E+01	ΑN	1.50E+05		- -	1.00E+04
benzo(b)liuoranthene	202-89-2	2.17E-02	ပ	8.58E-03	O	2.17E-02	AM	ΑN		-	NA NA
benzo(k)liuorantnene	207-08-9	2.17E-01	ပ	8.58E-02		2.17E-01	NA	AN			V V
penzo(a)pyrene	50-32-8	2.17E-03	၁	2.02E-03	ပ	2.17E-03	NA	7.50E+03		L	7 50E+03
dibona(1,z,3-cu)pyrefie	193-39-5	2.17E-02	ပ	8.58E-03	ပ	2.17E-02	¥	ΑN			NA NA
henzo(z h l'handana	53-70-3	2.17E-03	ပ	8.58E-04		2.17E-03	NA	3.00E+04		L	3.00F±04
perizo(g.n., i)per yiene	191-24-2	¥		ΑN		ΑN	¥	3.00E+04		 -	3 00 5 704
										-	0.00L
IO-13 (PAHS)											
naphthalene	91-20-3	3.13E+00	JC.	3.29E+00	20	3 13F+00	NA	7 BEETON		ŀ	
acenaphthylene	208-96-8	NA		NA		N	NIA	2 00 5 104		- }	7.86E+04
Acenaphthene	83-32-9	2.19E+02	nc	2 19E+02	2	2 10E±03		4.00E+02		-	Z.00E+0Z
fluorene	86-73-7	1.46E+02	nc	1,46E+02	T	1 46F±02	\$ \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	7 505 104		- -	1.25E+03
phenanthrene	85-01-8	ΑM		NA	T	NA	2 2	7.3001.00		_	7.50E+04
anthracene	120-12-7	1.10E+03	nc	1.10F+03	26	1 10E403	Z 2	Z.UUE+U3		-	2.00E+03
fluoranthene	206-44-0	1.46E+02	nc	1.46E+02		1.46E+02	Y A	3.00E+03		- -	6.00E+03
pyrene	129-00-0	1.10E+02	nc	1.10E+02	T	1.10E+02	NAN	1 50F+04		- -	3.00E+01
penzo(a)anthracene	56-55-3	2.17E-02	၁	8.58E-03	O	2.17E-02	NA	6 00F+02		- -	1.30E+04
Chrysene	218-01-9	2.17E+00	၁	8.58E-01	T	2.17E+00	NAN	2 00F+02		- -	0.005+02
Denzo(b)riuorantnene	205-99-2	2.17E-02	၁	8.58E-03		2.17E-02	NA W	NAN		-	AIA NIA
Denzo(k)illuoranmene	207-08-9	2.17E-01	၁	8.58E-02	ပ	2.17E-01	NA A	NA			
Benzo(e)pyrene	192-97-2	ΑΝ		NA		¥.	NAN	NA	AN		2 2
penzo(a)pyrene	50-32-8	2.17E-03	ပ	2.02E-03	ပ	2.17E-03	¥.	7.50E+03		╁	7 505 103
ringeno(1,2,3-cd)pyrene	193-39-5	2.17E-02	၁	8.58E-03		2.17E-02	¥ _N	¥		-	NA
henzola h imendano	53-70-3	2.17E-03	υ	8.58E-04		2.17E-03	¥	3.00E+04		L	3 00F+04
	181-24-2	NA		¥		NA	NA	3.00E+04		1	3.00E+04

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

		Daniel	The section is	C. 17 47 57 5							
Compound	CAS#	PRG	Endpoint	RBC	Endpoint	HBSL	ERPG		AEGI	Source	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
		(_E , m/Brl)	(c or nc)	(mg/m ₃)	(c or nc)	(tng/m³)	(µg/m³)	(µg/m³)	(mg/m³)	(T or E)	(ua/m³)
Dioxins and Furans								100			,
2378-Tetrachlorodibenzo-p-dloxin	1746-01-6	4.48E-08	3	4.17E-08	O	4.48E-08	NA	3 50F+00		F	2 505,00
12378-Pentachlorodibenzo-p-dioxin	40321-76-4	NA		N A		NA	NA	2.50F+00		- -	2.50E+00
123478-Hexachlorodibenzo-p-dioxin	39227-28-6	NA		AN		ΑN	NA	NA		-	AIA TUD
123678-Hexachlorodibenzo-p-dioxin	57653-85-7	NA		¥.	-	Ϋ́	ΑĀ	1.50F+01		L	1 505104
123789-Hexachlorodibenzo-p-dioxin	19408-74-3	1.48E-06	ပ	1.38E-06	0	1.48E-06	NA	NA		-	1.30E-101
1234678-Heptachlorodibenzo-p-dioxin	35822-46-9	NA		NA		N A	¥	N N			VN
Octachlorodibenzo(p)dioxin	3268-87-9	NA		NA		NA	¥	1.50E+02		-	1 50E402
2378-1 etrachlorodibenzo-p-furan	51207-31-9	NA		NA		NA	NA	2.00E+00		- -	2.00E+00
12370-Pentachiorodibenzo-p-turan	57117-41-6	¥		¥.		AN	ΑĀ	¥		,	NAN
234/8-Pentachlorodibenzo-o-furan	57117-31-4	¥		NA		ΝA	ΑA	7.50E-02		F	7.50F-02
123478-Hexachlorodibenzo-p-furan	70648-26-9	NA		ΝΑ		NA	Π	7.50E+00		L	7.50E+00
12307 6-riexacniorodibenzo-p-furan	57117-44-9	¥		NA		VΝ		2.50E+00		-	2 50F+00
123709-Hexachiorodibenzo-p-turan	72918-21-9	ΑΝ		NA W		ΑN	¥	¥ _N			NA
2340/8-Hexachlorodibenzo-p-furan	60851-34-5	Α		NA		NA	¥	1.50E+00		-	1 50F+00
12346/8-Heptachlorodibenzo-p-furan	67562-39-4	ΑΝ		AN		NA	×	AN			NA
1234789-Heptachlorodibenzo-p-furan	55673-89-7	NA		¥		₩	AN	NA			Z N
Octachlorodibenzofuran	39001-02-0	ΝΑ		NA NA		¥	¥	3.00E+02		F	3 00F+02
Energetics										-	70.000
Nitrobenzene	98-95-3	2.09E+00	၁ပ	2.19E+00	nc	2.09E+00	AN	1.51F+04		-	1 645,04
2-Nitrotoluene	88-72-2	3.65E+01	nc	3.65E+01	nc	3.65E+01	¥	N A		-	NA MA
3-Nitrotoluene	99-08-1	3.65E+01	nc	7.30E+01	nc L	3.65E+01	¥	¥			NA
4-Nitrotoliuene	0-66-66	3.65E+01	nc	3.65E+01	nc	3.65E+01	¥	3.37E+04		F	3 37F+04
Talli og iyeerine	55-63-0	4.80E-01	٥	4.47E-01	၁	4.80E-01	¥	¥			N N
1,3-Dinitrotoliono	0-99-66	3.65E-01	nc	3.65E-01	၁၁	3.65E-01	NA	3.00E+03		L	3.00E+03
2,0-Dinitionalidate	Z-0Z-909	3.65E+00	20	3.65E+00	ည	3.65E+00	¥.	6.00E+02		F	6.00E+02
Z,4-Dinitiotoluene	121-14-2	7.30E+00	nc	7.30E+00		7.30E+00	NA	6.00E+02	¥	Ŀ	6.00E+02
1,5,5-1111111 ODG1 ZGHG	4-35-48	1.10E+02	20	1.10E+02	nc	1.10E+02	NA	3.00E+04		L	3.00E+04
Z,4,0-1 III III 010 IUENE	118-96-7	2.24E-01	ပ	2.09E-01	ပ	2.24E-01	A A	2.50E+04		F	2.50E+04
A America of Prince 1	121-82-4	6.11E-02	٥	5.69E-02	၁	6.11E-02	AA	Ϋ́			NA
4-Arimo-z,b-Dimirotoluene	19406-51-0	NA		Ϋ́		NA	ΑĀ	MA			NA
Z-Minito-Z,b-Dinitrotoluene Tetral	35572-78-2	¥N S		¥		NA	NA	1.50E+04		F	1.50E+04
HMX	4/9-45-8	3.65E+01	nc	3.65E+01	nc	3.65E+01	NA	NA			NA NA
· · · · · · · · · · · · · · · · · · ·	70-11-0	1.83E+02	nc L	1.83E+02	nc	1.83E+02	- VA	-V			NA NA

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

		Region 9	Toxicity	Region 3	Toxicity	-		3			1
Compound	CAS#	PRG	Endpoint	RBC	Endpoint	HBSL	ERPG	TEBL	AEGL	Source	ATV
		(µg/m³)	(c or nc)	(lig/m³) (c or nc)	(c or nc)	(mg/m³)	(mg/m ₃)	(fug/m³)	(tug/m³)	(T or E)	
Pentaerythritoltefranitrate	78-11-5	AN		W		ž	¥	5,00E+01		F	5 00F+01
Dibutyl Phthalate	84-74-2	3.65E+02	nc	3.65E+02	nc Su	3.65E+02	AA	1.50E+04		- -	1 50F+04
Dioctyl Phthalate	117-81-7	4.80E-01	υ	4.47E-01	O	4.80E-01	NA	1.00E+04		-	1 00F+04
Diphenylamine	122-39-4	9.13E+01	nc	9.13E+01	nc	9.13E+01	NA	3.00E+04		-	3 00E+04
Footnotes:											0.001
PRG = Preliminary Remediation Goals					•						
c = cancer											
nc = non-cancer											
RBC = Risk-Based Concentration											
HBSL = Health-Based Screening Level											
(E) ERPG = Emergency Response Planning Guidelines	ing Guidelines	,									
(T) TEEL = Temporary Emergency Exposure Limits	sure Limits	•									
(A) AEGL = Acute Exposure Guideline Level	evel										
ATV = Acute Toxicity Value											
NA = Not Available											
		With the second									

APPENDIX D RISK ASSESSMENT DATA

	> 12			9	9	2	2	9		na	na	na	na	na	2		па	2		na	na	na		on O	2	na	on O	na	na	2	B	na	2	yes	Б	E .	
Gun	Cacute/ ATV			3.65E-03	9.67E-04	4.89E-02	1.44E-02	6.05E-03							1.52E-02			5.60E-03						1.60E-03	1.27E-01		7.49E-02			3.07E-04			9.12E-03	╁			
ne M2 Machine	Acute Toxicity Value (µg/m³)			1.75E+04	5.40E+07	2.30E+05	3.08E+04	7.89E+02		1.60E+03	4.50E+03	9.93E+03	1.30E+03	3.00E+03	2.00E+03		5.00E+03	5.17E+03		NA	NA	NA		3.00E+04	1.50E+03	3.00E+01	1.50E+03	5.00E+00	3.00E+01	3.00E+04	1.50E+03	6.00E+01	3.00E+03	1.50E+02	3.00E+04	3.00E+03	
fired from the	C _{acute} (µg/m³)			6.38E+01	5.22E+04	1.12E+04	4.44E+02	4./8E+00		Y.	¥.	¥N.	¥	NA NA	3.04E+01		ΑN	2.89E+01		5.72E+02	6.46E+02	5.80E+02	100	4.80E+01	1.30ETUZ	1 40 T C T	1.12E+02	¥		9.22E+00	NA	NA	2.74E+01	3.03E+02	NA NA	NA	
k, M1A1 Dobic:	> 12			ဍ	gu	2	2	2	9	2 2	Ja	na	g	g	E E		na	2		2	2	2	1	2 2	2 2	<u> </u>	2 2	<u> </u>	ua :	<u>la</u>	_a	na	2	2	eu L	g E	
er Blank, DC	C _{chronic} / HBSL		20 100	2.88E-U3	100 1	5.29E-03	3.22E-03	4.01E-04									4 001 00	1.09E-02	100 1	5.38E-UZ	6.08E-02	1.82E-01	4 40E 00	1 53E-04		2 53E-04	2:00F-01						2.20E-04	2.37E-01			
Cartridge, .50 caliber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	Health-Based Screening Level (µg/m³)		4 0AE 102	NN NN	1 OUE ±0.4	1.00E+04	8.00E+02	10.100.0	NA.	2 08E+01	MY	AN AN	4045.04	1.04E+0.1	2	7 30E±04	3 135+00	9.13E+00	E OUE LOA	5.00E+01	1.50E±01	1,305,10	5 11E+00	1.46E+00	4.47E-04	5.21E-01	8.00E-04	1 07E-03	NA VIN	4 525 04	1.33E-04	2.20E+02	1.40E+02	1.30E+00	F 44E 00	0.11E-02	
ပ	C _{chronic} (µg/m³)		3.00F-01	6.14E+01	5.29F+01	5 22F-01	2.25E-02		NA NA	WA	NA	NA NA	ΔN	1.43E-01		AN	3.40F-02	10.10	2 69E+00	3.045+00	2.73E+00	20.11	5.65E-02	2.23E-01	Ϋ́	1.32E-01	¥N	¥	1.08E-02	ΔM	ΔN	3 22E-02	3.55E-02	NA	NA		
	Compound	Permanent Gases	Ammonia (NH3)	Carbon Dioxide (CO2)	Carbon Monoxide (CO)	Oxides of Nitrogen (as NO)	Sulfur Dioxide (SO2)	Acid Gases	Hydrogen fluoride	Hydrogen chloride	Hydrogen bromide	Nitric Acid	Phosphoric acid	Sulfuric Acid	Cyanide	Particulate Cyanide	Hydrogen Cyanide	Particulates	Total Suspended Particulate	PM10	PM2.5	Metals	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Manganese		Risk100m.xls

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	ຮື	Cartridge, .50 caliber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	er Blank, f DC	M1A1	k, M1A1 fired from the DODIC: A559	ле M2 Machine	Gun	
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronlc} / HBSL	> 12	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
Nickel	AN	7.30E+01		na	AN	3 005+03		
Selenium	AA	1.83F+01			S VI	3.00E+03		g
Silver	NA	1.83E+01		2 2	\$ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	9.00E+02		na
Thallium	AN	2.56E-01		2 2	Z V	3.000-102		na
Vanadium	NA	2.56E+01		2 2	Ç A	3.00E+0Z		па
Zinc	1.44E-02	1.10E+03	1.31E-05	2 2	1 22E±01	1.50E+02	1075	na
TO-11 Carbonyls					10.177.	9.00E-104	4.U/E-04	2
Formaldehyde	1.02E-03	1.48E-01	6.91E-03	2	5.06E-01	1 23F±03	A 12E 04	1
Acetaldehyde	NA	8.73E-01		ē	¥N	1 80F+04	1.125-04	2 2
Acetone	NA	3.65E+02		na	NA	2.37E+06		<u> </u>
Acrolein	¥	2.09E-02		na	۸A	2.30F+02		3 5
Proprionaldehyde	NA NA	NV		Вã	NA	7.50E+04		2 6
Crotonaldehyde	NA	3.54E-03		na	Ϋ́	5 72E+03		2 2
Butyraldehyde	AA	N/		E	NA NA	7.38F+04		2 2
Benzaldehyde	NA	3.65E+02		Ē	NA NA	1.50F+04		0 0
Isovaleraldehyde	NA	N		Вã	¥	NA		0 0
Valeraldehyde	ΝΑ	NV		БĒ	ΑN	NA NA		2 2
o,m,p-Tolualdehyde	NA	NV		na	¥	¥N.		2 2
Hexaldehyde	NA	NV		па	ΑN	XX		2 6
2,5-Dimethylbenzaldehyde	W	NV		Вã	¥	NA NA		2 2
VOCs								2
Propene	9.19E-04	ΝN		Б	1.95E-01	NA NA		9
Dichlorodifluoromethane	3.31E-05	2.09E+02	1.59E-07	2	2.82E-02	1.48E+07	1.90E-09	2
Chiorodiffuoromethane	NA.	5.11E+04		na	NA	4.41E+06		na L
Chloromethan	NA 2	NN.		na	ΑN	2.10E+07		na
Visal Objected	0.41E-U5	1.07E+00	6.00E-05	2	1.27E-01	2.06E+05	6.17E-07	2
1 3 Butodiano	¥ S	2.20E-02		<u>a</u>	NA	1.28E+04		na
allaneanor.	¥.	3.74E-03		na	NA	2.20E+04		na
Chambre	Y.	5.21E+00		g	NA	5.82E+04		la
Dichloroflugomethers	AN S	2.32E+00		В	NA	2.64E+06		na
Trichlorofluoromothano	1 por or	Z.09E+02		<u>a</u>	NA	1.48E+07		na
Dontono	CO-200.	7.30E+02	2.58E-08	2	1.60E-02	2.81E+06	5.71E-09	2
Acrolein	1 00F 03	NV S		na	A'A	1.80E+06		na
	1,00E-03	Z.U9E-UZ	4.80E-02	2	2.13E-01	2.30E+02	9.26E-04	2

Table D-1: Comparison of Modeled Air Concentrations with Health-Based Values - 100 meter location

	ပိ	Cartridge, .50 caliber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	er Blank, I DC	MA1	k, M1A1 fired from ti DODIC: A559	ne M2 Machine	Gun	
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
1,1-Dichloroethene	Y.	5.21E+02		na	AN	7 025104		
Freon 113	NA	3.13E+04		e	AN	0 58E+04		na !
Acetone	1.21E-02	3.65E+02	3.32E-05	2	1.03E+01	2 37E+06	1 245 00	ag :
Methyl lodide	AN	N		na E	AN	4.37E+00	4.34E-UD	2
Carbon Disulfide	AN	7.30E+02		2	AN	3.14E±04		na !
. Acetonitrile	5.69E-04	6.20E+01	9.17E-06	2	4 84E-01	4.01E+04	4 905	na
3-Chloropropene	AN	1.04E+00		Ba	AN	9.395+03	4.80E-U6	2
Methylene Chloride	2.36E-03	4.09E+00	5.77E-04	2	1.17E+00	6.96F+05	1 RBE 08	<u> </u>
tert-Butyl Alcohol	WA	NV		na	ΝΑ	4.55F+05	1.002-00	2 2
Acrylonitrile	8.57E-05	2.83E-02	3.03E-03	2	4.25E-02	2 17E+04	4 ORE OR	B 2
trans-1,2-Dichloroethene	AA	7.30E+01		Ba	NA	A 05E 104	1.30E-00	2
Methyl t-Butyl Ether	NA	3.13E+03		E	AN	4.32E+04		na
Hexane	7.43E-03	2.09E+02	3.56E-05	2	6.32F+00	5.02E+03	4 2007 05	an l
1,1-Dichloroethane	NA	5.21E+02		2	NA	1.20E+03	1.20E-U5	2
Vinyl Acetate	NA	2.09E+02		2	NA	1 005104		23
cis-1,2-Dichloroethene	AN	3.65E+01		2	AN	7 025-105		g
2-Butanone	AA	1.04E+03		2 2	AN	0 965-105		na
Ethyl Acetate	NA	3.29E+03		2 2	AN	4.44E.06		па
Methyl Acrylate	NA	1.10E+02		2	AN	NA NA		na
Chloroform	¥.	8.35E-02		2	MA	100 Jac 0		ā
1,1,1-Trichloroethane	ΝΑ	1.04E+03		2 2	AN	1 04E±08		g
Carbon Tetrachloride	NA	1.28E-01		E	NA	1 285+05		Ja
1,2-Dichloroethane	NA	7.39E-02		Ba	AN	A ORETON		20
Benzene	2.90E-03	2.49E-01	1.16E-02	2	1.44F+00	1 58E 105	0 225	<u> </u>
Isooctane (2,2,4-trimethylpentane)	NA NA	N		na	ΑΝ	3.50E+05	9.22E-00	2
Heptane	NA NA	N\		na	¥	1 80F+06		<u> </u>
Trichloroethane	NA NA	1.04E+03		na	AN N	1 94F±06		<u> </u>
Ethyl Acrylate	NA NA	1.40E-01		2	₹ Ž	6 14F±04		la la
1,2-Dichloropropane	NA	9.89E-02		na	AN	5 08E+04		<u>a</u>
Methyl Methacrylate	AA	7.30E+02		200	ΔN	4 00E 10E		B
Dibromomethane	NA V	3.65E+01		2 2		4.095.403		g
1,4-Dioxane	NA A	6.11F-01		2 2	Z	Z.50E+U5		Ба
Bromodichloromethane	ΑN	1.08E-01		2 2	ZN VN	9.00E+04		na
4-Methyl-2-Pentanone	NA	8.34E+01		2 2	V V	4.00E+03		na
27. 200 67.00				1	<u> </u>	3.07 = +03		na

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	င်	Cartridge, .50 caliber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	er Blank, N DO	M1A1 DIC:	k, M1A1 fired from ti DODIC: A559	า e M2 Machi ne	Gun	
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronle} / HBSL	> 12	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
Toluene	3.65E-04	4.02E+02	9.10E-07	2	7.77E-02	1.88E+05	4 14E-07	٤
Octane	NA A	NV		па	NA	NA N	5	2 2
trans-1,3-Dichloropropene	NA	5.17E-02		na	NA NA	NA		3 0
Ethyl Methacrylate	NA	3.29E+02		na	¥.	¥.		2 2
1,1,2-Trichloroethane	NA	1.20E-01		na	NA	1.64E+05		2 2
Tetrachloroethene	NA NA	3.31E+00		ВE	AN	6.78E+05		2 2
2-Hexanone	AN.	5.11E+00		na	¥N N	4.09E+04		2 2
Dibromochloromethane	AN	8.00E-02		па	Ϋ́	6.00E+03		2 2
1,2-Dibromoethane	W	8.73E-03		na	NA	1.54E+05		na
Chlorobenzene	W.	6.21E+01		na	NA	1.38E+05		na
1,1,1,2-letrachloroethane	NA	2.60E-01		na	NA NA	5.15E+04		na na
Ethylbenzene	NA	1.06E+03		na	NA	5.43E+05		na
m&p-Xylene	2.55E-04	7.30E+02	3.49E-07	no	2.17E-01	6.51E+05	3.33E-07	2
o-Xylene	AN	7.30E+02		na	NA	6.51E+05		na
Styrene	2.50E-04	1.06E+03	2.36E-07	no	5.32E-02	2.13E+05	2.50E-07	92
Bromoform	AN	1.75E+00		na	NA	6.20E+03		na
Cumene	NA	4.02E+02		na	NA	2.46E+05		na Eu
1, 1, 2, 2-1 etrachloroethane	Y.	3.31E-02		na	NA	2.06E+04		la
1,2,3-1richloropropane	ΨN	9.61E-04		na	AN	6.03E+04		Ba
Bromobenzene	NA NA	1.04E+01		na	ΝΑ	4.82E+04		na E
4-Ethyltoluene	¥.	2		na	NA	1.25E+05		la
1,3,5-1 rimetnylbenzene	₹	6.21E+00		па	NA	3.68E+05		na
Alpha Metnyl Styrene	¥	2.56E+02		g	NA	NA		na
1 3 Dichloroborzono	¥ ×	6.21E+00		ē	Ā	1.80E+05		na
1 4-Dichlorobarrano	\$ 5	3.29E+00		g	¥	3.61E+04		na
Board Cherids	X	3.06E-01		Вa	ΑN	6.61E+05		na
1 2 Dielich	¥.	3.96E-02		2	NA	5.20E+03		na
I,z-Dichlorobenzene	¥.	2.09E+02		na	NA	3.01E+05		na
rexachiorethane	¥N.	4.80E-01		па	NA	2.90E+04		Бã
1,2,4-Ilichiorobenzene	¥	2.08E+02		na	NA	3.71E+04		na
Hexachiorobutadiene	Ψ.	8.73E-02		na	AN	3.21E+04		na
1 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1								
Hydrocarbons								
Methane	1.08E-01	N		na	9.21E+01	3.30E+06	2 79F-05	2
							7,, -,,	?

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Table D-1: Comparison of Modeled Air Concentrations with Health-Based Values - 100 meter location

	Ca	Cartridge, .50 caliber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	er Blank, I DO	M1A1	k, M1A1 fired from ti DODIC: A559	ne M2 Machine	Gun	÷.
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chrontc} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
Ethylene	1.08E-02	N		na	9.21E+00	4 ROF+05	ט טטב טב	
Acetylene	5.82E-03	N		па	1.24E+00	NA	Z.00E-03	2 2
Ethane	NA	N		na	NA NA	AN		E !
Propylene	NA	N/		na	AN			g
Propane	NA	N		g	A N	3 78E±08		na !
Propyne (methyl acetylene)	NA	N/		na	¥	2.79F+06		a la
Isobutane	NA	NV		g	¥X	9.52F+05		<u> </u>
i-butene/isobutylene (115-11-7)	NA	NV		na	AM	6.87E+06		2 2
1,3-Butadiene/butane	NA	3.74E-03		na	AN A	2.20E+04		<u> </u>
cis-butene	NA	NV		na	¥	1 72F±04		<u> </u>
1-Butyne	AA	N		na	AN	NA		<u>a</u>
trans-Butene	NA	N/		E	AN	1 725+04		a
2-Butyne (crotonylene)	WA	N		2	V N	NA TOP		g
n-Pentane	AN	N .		2 6	QN V	NA 1 90E 100		na
n-Hexane	8.30E-03	2 10F402	2 05E 05	2 2	00.1007	1.00E+U0		na
SVOCs		30.11	0.305-00	2	1.00E+00	5.28E+05	1.34E-05	2
n-nitrosodimethylamine	NA	1.37E-04		2	VIV	201.00		
bis(2-chloroethyl)ether	¥	5.82F-03		2 2	2 2	Z.30E+03		g
phenol	AN AN	2.19E+03		2 2		5.85E+04		na
2-chlorophenol	¥	1.83E+01		2 2	Ç Ş	3.635+04		na
1,3-Dichlorobenzene	¥	3.29E+00		2 2	S S	0.200703		Вa
1,4-dichlorobenzene	¥	3.06E-01		2 2	Ç V	3.01E+04		na
1,2-dichlorobenzene	¥	2.09E+02		2 2	S N	0.010100		g
benzyl alcohol	ΨN	1.10E+03		2 2	AN	5.015+03		na
bis(2-chloroisopropyl)ether	NA	1.92E-01		2	AN	8.00E±04		g
2-methylphenol	NA	1.83E+02		Pa Ba	AN	NA NA		la
hexachloroethane	NA	4.80E-01		2	₽N	POTE DO C		e e
n-nitroso-di-n-propylamine	AN	9.61E-04		2	V.V.	2.90L-104		g
4-methylphenol	¥	1.83E+02		2 2	\$ \$	Z.00E+0Z		na
nitrobenzene	Ą	2 09E+00				¥N.		na
isophorone	NA	7 08E+00		<u>a</u>	NA.	1.51E+04		na
2-nitrophenol	AN	NV AN		e i	¥	2.83E+04		na
2,4-dimethylphenol	NA	7 305 104		na	¥Z.	A A		na
bis(2-chloroethoxy)methane	V AN	NN/		g i	¥.	A N		na
		ANI		na	NA	۸A		E

	් -	Cartridge, .50 caliber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	er Blank, I DC	k, M1A1 fired DODIC: A559	fired from t A559	he M2 Machine	Gun	-14
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chrontc} / HBSL	> 12	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 1?
2,4-dichlorophenol	NA	1.10E+01		na	AN	3.00F±04		2
1,2,4-trichlorobenzene	NA	2.08E+02		na	NA	3.71E+04		2
naphthalene	8.90E-04	3.13E+00	2.85E-04	2	7.57E-01	7 R6E+04	0 835 08	E
4-chloroaniline	NA	1.46E+01		na	NA	3.00E+04	9.001-00	2 2
hexachlorobutadiene	NA	8.62E-02		na	WA	3.21E+04		2 2
4-chloro-3-methylphenol	NA	NV		na	WA	2.00E+04		2 2
2-methylnaphthalene	ΑN	7.30E+01		na	ΑN	2.00E+04		2 2
nexachlorocyclopentadiene	NA	7.30E-02		na	¥	2.23E+02		2 2
2,4,6-trichlorophenol	ΑN	1.10E+02		na	ΑN	3.00E+04		2 2
2,4,5-trichlorophenol	ΑΝ	3.65E+02		na	ΑN	3.00E+04		2 2
z-cnloronaphthalene	AN A	2.92E+02		na	ΑN	6.00E+02		2 0
2-nitroaniline	ΑĀ	2.09E-01		na	NA	NA NA		2 2
Acenaphthylene	NA	N<		na	¥	2.00F+02		2 2
dimethylphthalate	NA	3.65E+04		na	Ϋ́	1.50F+04		200
2,6-dinitrotoluene	NA	3.65E+00		na	NA	6.00F+02		2 2
acenaphthene	NA	2.19E+02		na	NA	1.25E+03		2 2
3-nitroaniline	NA NA	NV		na	NA	NA		2 2
2,4-dinitrophenol	ΝΑ	7.30E+00		na	AN	7.50E+03		2 2
dibenzofuran	ΨN	1.46E+01		na	AN AN	NA		2 6
Z,4-dinitrotoluene	¥.	7.30E+00		na	NA	6.00E+02		g
Fliorend	AN S	2.92E+01		na	NA	3.00E+04		na
riuorena	YN S	1.46E+02		na	ΝΑ	7.50E+04		na
diothylabitaleta	AN S	AN .		na	NA	NA		na
minarate	W.	2.92E+03		na	AA	1.50E+04		na
4-nitroaniline	NA:	N		na	NA	9.00E+03		na
4,0-diffiltro-z-metnyipnenol	NA:	3.65E-01		na	NA	5.00E+02		na E
n-mirosodipnenylamine(1)	NA.	1.37E+00		na	AN	NA		l ec
4-bi officialitientylether	NA	N		na	NA	¥		na
nexachiorobenzene	NA	4.18E-03		na	NA	7.50E+01		na
pentachlorophenol	NA	5.60E-02		na	AN	1.50E+03		na
pnenanthrene	SA.	N		na	NA	2.00E+03		200
anthracene	¥	1.10E+03		na	NA	6.00E+03		2 2
di-n-butyiphthalate	NA.	3.65E+02		na	NA	1.50E+04		g
inoralitierie	NA.	1.46E+02		na	NA	3.00E+01		na

	Ca	Cartridge, .50 caliber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	r Blank, N DO	HA1 DIC:	k, M1A1 fired from th DODIC: A559	ne M2 Machine	Gun	:
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronlc} / HBSL	> 1?	С _{асиtе} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 1?
pyrene	NA	1.10E+02		na	NA	1.50E+04		na
butylbenzylphthalate	NA	7.30E+02		na	NA	5.00E+05		na
benzo(a)anthracene	ΑΝ	2.17E-02		na	NA	6.00E+02		na
chrysene	NA	2.17E+00		na	NA	2.00E+02		na
3,3-dichlorobenzidine	NA	1.50E-02		na	NA	6.21E+03		na
bis(2-ethylhexyl)phthalate	NA	4.80E-01		na	NA	1.00E+04		na
di-n-octylphthalate	NA	7.30E+01		na	NA	1.50E+05		na
benzo(b)fluoranthene	NA	2.17E-02		na	ΑN	AN		na
benzo(k)fluoranthene	NA	2.17E-01		na	NA	NA		na
benzo(a)pyrene	NA	2.17E-03		na	NA	7.50E+03		na
indeno(1,2,3-cd)pyrene	NA	2.17E-02		na	NA	NA		na
dibenz(a,h)anthracene	NA	2.17E-03		na.	NA	3.00E+04		ua
benzo(g,h,i)perylene	NA	NN		na	NA	3.00E+04		na
TO-13 (PAHs)								
naphthalene	3.96E-04	3.13E+00	1.27E-04	2	3.37E-01	7.86E+04	4.29E-06	ou
acenaphthylene	1.56E-05	N<		па	1,33E-02	2.00E+02	6.63E-05	00
Acenaphthene	1.84E-06	2.19E+02	8.39E-09	2	1.56E-03	1.25E+03	1.25E-06	2
fluorene	4.79E-06	1.46E+02	3.28E-08	2	4.08E-03	7.50E+04	5.44E-08	ou
phenanthrene	4.08E-06	N/		na	3.47E-03	2.00E+03	1.74E-06	ou
anthracene	NA	1.10E+03		na	AN	6.00E+03		na
fluoranthene	5.23E-06	1.46E+02	3.58E-08	2	4.45E-03	3.00E+01	1.48E-04	on O
pyrene	4.97E-06	1.10E+02	4.54E-08	2	4.23E-03	1.50E+04	2.82E-07	2
benzo(a)anthracene	NA	2.17E-02		ē	NA NA	6.00E+02		na
chrysene	NA	2.17E+00		Б	NA	2.00E+02		na
benzo(b)fluoranthene	NA	2.17E-02		na	NA	NA		na
benzo(k)fluoranthene	NA	2.17E-01		na	NA	NA		na
Benzo(e)pyrene	NA	NN		na	NA	NA		na
benzo(a)pyrene	NA	2.17E-03		na	NA	7.50E+03		na
indeno(1,2,3-cd)pyrene	NA	2.17E-02		g	Ϋ́	¥N V¥		na
dibenz(a,h)anthracene	NA	2.17E-03		2	¥	3.00E+04		na
benzo(g,h,i)perylene	NA	⋛		na	A A	3.00E+04		ā
Dioxins and Furans								
2378-Tetrachlorodibenzo-p-dioxin	¥	4.48E-08		Ba	ΨN	3.50E+00		g

	S	Cartridge, .50 caliber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	er Blank, N DO	k, M1A1 DODIC:	fired from th A559	ıе M2 Machine	Gun	
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	G _{chronic} / HBSL	> 1?	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	× 12
12378-Pentachlorodibenzo-p-dioxin	NA	NV		na	AN	2.50E+00		na
123478-Hexachlorodibenzo-p-dloxin	NA	NV		ē	ΑN	¥		2
123678-Hexachlorodibenzo-p-dioxin	NA	N		na	ΑN	1.50E+01		20
123789-Hexachlorodibenzo-p-dioxin	NA	1.48E-06		na	NA	NA A		E
1234678-Heptachlorodibenzo-p-dioxin	1.49E-10	NV		na	3.18E-08	Ą		Ba
Octachlorodibenzo(p)dioxin	2.68E-09	NV		na	2.28E-06	1.50E+02	1.52E-08	90
2378-Tetrachlorodibenzo-p-furan	NA	NV	·	па	AN A	2.00E+00		Ba
12378-Pentachlorodibenzo-p-furan	NA A	NV		na	AN	AN		na
23478-Pentachlorodibenzo-o-furan	NA	N\		na	ΑA	7.50E-02		na
123478-Hexachlorodibenzo-p-furan	NA	NV		na	NA	7.50E+00		g
123678-Hexachlorodibenzo-p-furan	NA	N		na	NA NA	2.50E+00		na
123789-Hexachlorodibenzo-p-furan	NA	NV		na	ΑΝ	NA		n a
234678-Hexachlorodibenzo-p-furan	NA	N		na	Ϋ́	1.50E+00		na na
1234678-Heptachlorodibenzo-p-furan	2.86E-11	NV		na	6.08E-09	NA		na
1234789-Heptachlorodibenzo-p-furan	ΝΑ	N		na	WA	NA		na
Octachlorodibenzofuran	4.34E-10	N		na	3.69E-07	3.00E+02	1.23E-09	2
Energetics								
Nitrobenzene	NA	2.09E+00		na L	NA	1.51E+04		na
2-Nitrotoluene	ΑΝ	3.65E+01		Бa	ΑN	NA		E
3-Nitrotoluene	ΑN	3.65E+01		па	NA	NA		БĒ
4-Nitrotoluene	ΑΝ	3.65E+01		na	NA	3.37E+04		na
Nitroglycerine	AN	4.80E-01		na	NA	NA		na
1,3-Dinitrobenzene	ΥN	3.65E-01		na	۸A	3.00E+03		na
2,6-Dinitrotoluene	¥N.	3.65E+00		na	NA NA	6.00E+02		na
2,4-Dinitrotoluene	ΑN	7.30E+00		na	AN	6.00E+02		na
1,3,5-Trinitrobenzene	Ϋ́Ν	1:10E+02		na	NA	3.00E+04		na
2,4,6-Trinitrotoluene	Ϋ́	2.24E-01		na	NA	2.50E+04		E
RDX	۸A	6.11E-02		na	NA	ΑN		na
4-Amino-2,6-Dinitrotoluene	AN NA	N N		na	AN	NA AN		Вã
2-Amino-2,6-Dinitrotoluene	ΑΝ	2		na	NA	1.50E+04		E
Tetryl	NA NA	3.65E+01		na	NA	AN		na
HMX	ΑN	1.83E+02		na	NA	NA		na
Pentaerythritoltetranitrate	AN.	N		g	NA	5.00E+01		na
Dirutyi Prithalate	NA	3.65E+02		na	NA	1.50E+04		na

Table D-1: Comparison of Modeled Air Concentrations with Health-Based Values - 100 meter location

	ပိ	Cartridge, .50 callber Blank, M1A1 fired from the M2 Machine Gun DODIC: A559	er Blank, I DO	M1A1	k, M1A1 fired from th DODIC: A559	e M2 Machine	Gun	
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	C _{acute} (µg/m³)	/ > 1? C _{acute} (µg/m³) Acute Toxicity C	Cacute/ ATV > 1?	> 12
Dischiel Obthelete	V . 4							
Diociyi Primare	¥Z	4.80E-01	-	e	ΑN	1 00E±04		Ş
Dinhenvlamine	ΔM	0 425104				100.1		<u>a</u>
	147	9.135.101			- KZ	3.00E+04		na
200								

Footnotes:

NA = Not applicable because compound was not detected NV = No value available

C_{chronic =} Chronic time-averaged concentration

HBSL = Chronic health-based screening level

>1? = Is the ratio greater than one?

na = Not available because health-based sceening value is not available or not applicable if compound was not detected Cacute = average acute concentration

ATV = Acute toxicity value

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Table D-2: Comparison of Modeled Air Concentrations with Health-Based Values: Total Petroleum Hydrocarbons - 100 meter location

	Cartridge, .50 c	aliber Blank, M1A	Cartridge, .50 callber Blank, M1A1 fired from the M2 Machine Gun	12 Machine Gun
			500 Y	
Compound (a)	C _{chronic} (µg/m³)	С _{chronte} (µg/m³)	C _{chronic} (µg/m³)	Cehronic (µg/m³)
	Aliphatic:C<=8	Allphatic:C>8	Aromatic:C<=8	Aromatic:C>8
Hexane	7.43E-03	NA	NA	NA
Benzene	NA	NA	6.77E-03	NA
Toluene	NA	NA	3.65E-04	NA
m&p-Xylene	NA	NA	2.55E-04	NA
Styrene	NA	NA	NA	2.50E-04
n-Hexane	8.30E-03	NA	ΑN	NA
naphthalene	NA	NA	ΑN	8.90E-04
naphthalene	NA	NA	AN	3.96E-04
acenaphthylene	NA	NA	ΑN	1.56E-05
Acenaphthene	NA	NA	AN	1.84E-06
fluorene	NA	NA	AN	4.79E-06
phenanthrene	NA	NA NA	AA A	4.08E-06
fluoranthene	NA	NA	٩N	5.23E-06
Total (µg/m³)	1.57E-02	0.00E+00	7.39E-03	1.57E-03
Derived Health-Based Screening Level	1.92E+04	1.04E+03	4.17E+02	2.09E+02
. Cehronic/HBSL	8.20E-07	0.00E+00	1.77E-05	7.52E-06
>12	00	no	ou Ou	
NA = Not applicable because compound was not detected C _{chronle} = chronic time-averaged concentration				
HBSL = Chronic health-based screening level				*

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

		Cartrid	lge, 0.50 c DC	allbei DIC:	Cartridge, 0.50 caliber, Blank, M1A1 (M2) DODIC: A559	41 (M2)		
Compound	C _{chronle} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronle} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	× 12
Permanent Gases								
Ammonia (NH3)	1.26E-01	1.04E+02	1.21E-03	2	2.68E+01	1.75F+04	1 535.03	5
Carbon Dioxide (CO2)	2.58E+01	N.		na	2.19E+04	5.40E+07	4 06F-04	2 2
Carbon Monoxide (CO)	2.22E+01	1.00E+04	2.22E-03	2	4.72E+03	2 30F+05	2 05E 02	2 2
Oxides of Nitrogen (as NO)	2.19E-01	1.00E+02	2.19E-03	2	1.87E+02	3.08F+04	6.07E-02	2 2
Sulfur Dioxide (SO2)	9.44E-03	8.00E+01	1.18E-04	no	2.01E+00	7.89E+02	2.54E-03	2 2
Acid Gases								
Hydrogen fluoride	NA	N/		na	AN	1.60E+03		2
Hydrogen chloride	NA	2.08E+01		Ba	¥	4 50F+03		2 2
Hydrogen bromide	NA	N		na	NA	9 93E+03		2 2
Nitric Acid	NA	N<		na	¥	1.30E+03		2 2
Phosphoric acid	AN	1.04E+01		na	AN	3 00F+03		2 2
Sulfuric Acid	6.01E-02	N		g	1.28E+01	2.00E+03	R 30E 03	<u> </u>
Cyanide						00.100.11	0.29F-03	2
Particulate Cyanide	NA NA	7.30E+01		g	AN	5 00E±03		9
Hydrogen Cyanide	1.43E-02	3.13E+00	4.57E-03	2	121F+01	5 17E±03	2 255 03	<u> </u>
Particulates						20.11	4.30E-03	2
Total Suspended Particulate	1.13E+00	5.00E+01	2 26E-02	2	2 40E±02	ALA		
PM10	1.28E+00	5.00E+01	2.55E-02	2 2	2.70L+02			Ba
PM2.5	1.15E+00	1.50E+01	7.64E-02	2	2 44F+02	QN AN		g g
Metals						5		B
Aluminum	2.37E-02	5.11E+00	4.64E-03	2	2.02E+01	3.00F+04	6 72E-04	2
Antimony	9.37E-02	1.46E+00	6.42E-02	2	7.97E+01	1.50E+03	5.1E-07	2 2
Arsenic	NA	4.47E-04		E	¥	3.00E+01	20 11 05	2 2
Barium	5.55E-02	5.21E-01	1.06E-01	2	4.72E+01	1.50E+03	3 15E-02	2 2
Beryllium	NA	8.00E-04		ē	ΑN	5.00E+00		2 6
Cadmium	Ϋ́	1.07E-03		na	ΑN	3.00E+01		2 2
Calcium	4.55E-03	NV		na	3.87E+00	3.00E+04	1.29F-04	2
Chromlum	A A	1.53E-04		ВП	AN	1.50E+03		2 6
Cobalt	ΑĀ	2.20E+02		g	ΑN	6.00E+01		2
Copper	1.35E-02	1.46E+02	9.25E-05	ဥ	1.15E+01	3.00E+03	3.83E-03	2
reao	1.50E-01	1.50E+00	9.97E-02	2	1.27E+02	1.50E+02	8.48E-01	no

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

		Cartrio	lge, 0.50 c DC	alibe	Cartridge, 0.50 caliber, Blank, M1A1 (M2) DODIC: A559	41 (M2)		
Compound	С _{chronte} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	С _{асиte} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 1?
Magnesium	AA	NV		na	NA	3.00E+04		na
Manganese	AN NA	5.11E-02		na	AA	3.00E+03		22
Nickel	NA	7.30E+01		na	NA	3.00E+03		2
Selenium	NA	1.83E+01		na	AN	6.00E+02		2 2
Silver	NA	1.83E+01		na	AN	3.00E+02		2 2
Thallium	AA A	2.56E-01		па	NA	3.00E+02		e
Vanadium	AN AN	2.56E+01		na	NA	1.50E+02		B
Zinc	6.03E-03	1.10E+03	5.51E-06	20	5.13E+00	3.00E+04	1.71E-04	2
IO-11 Carbonyls			•					
Formaldehyde	4.29E-04	1.48E-01	2.90E-03	on O	2.13E-01	1.23E+03	1.73E-04	2
Acetaldehyde	AN	8.73E-01		па	۸A	1.80E+04		2 2
Acetone	NA	3.65E+02		na	NA	2.37E+06		2 2
Acrolein	NA A	2.09E-02		na	ΑN	2.30E+02		2 2
Proprionaldehyde	NA	N		na	ΝΑ	7.50E+04		E
Crotonaldehyde	ΑN	3.54E-03		na	ΑN	5.72E+03		Da Da
Butyraldehyde	WA	N		na	NA	7.38E+04		Ba
Benzaldenyde	AN.	3.65E+02		na	NA	1.50E+04		na
Isovaleraldenyde	Y.	N/		na	NA	ΑN		na
Valeraldenyde	AA	NS.		na	NA	N A		na
o,m,p-1 olualdehyde	NA.	≥		na	NA	AN		ББ
Hexaldenyde	V.	N.		В	NA	NA		na
VOCe	Y.	N.		па	NA	NA		na
Propene	3.86E-04	N/		2	8 20 = 03	VIA.		
Dichlorodifluoromethane	1.39E-05	2.09E+02	6.67E-08	2 2	1 18F-02	1 48E±07	7 085 40	E 2
Chlorodifluoromethane	NA	5.11E+04		g	NAN A	4.41F+06	7.30E-10	2 2
Freon 114	NA	N		па	AN	2.10E+07		2 2
Chloromethane	2.69E-05	1.07E+00	2.52E-05	2	5.34E-02	2.06E+05	2.59E-07	2
Vinyl Chloride	ΑN	2.20E-02		na	¥	1.28E+04		2
1,3-Butadiene	NA NA	3.74E-03		na	¥	2.20E+04		2
Bromomethane	NA NA	5.21E+00		na	NA	5.82E+04		E
Chloroethane	NA	2.32E+00		na	NA	2.64E+06		na

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

		Cartrid	lge, 0.50 ca	aliber	Cartridge, 0.50 caliber, Blank, M1A1 (M2)	11 (M2)		
			8	<u>:</u>	DODIC: A559			10
Compound	C _{chronte} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chrontc} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 1?
Dichlorofluoromethane	۸N	2.09E+02		na	ΝΑ	1.48E+07		na
Trichlorofluoromethane	7.90E-06	7.30E+02	1.08E-08	2	6.72E-03	2.81E+06	2.40E-09	2
Pentane	NA	NV		na	NA	1.80E+06		Ba
Acrolein	4.21E-04	2.09E-02	2.02E-02	2	8.95E-02	2.30E+02	3.89E-04	2
1,1-Dichloroethene	NA	5.21E+02		na	ΑN	7.92E+04		62
Freon 113	NA	3.13E+04		па	ΝΑ	9.58E+06		na
Acetone	5.08E-03	3.65E+02	1.39E-05	ou	4.32E+00	2.37E+06	1.82E-06	2
Methyl lodide	NA	NV		na	NA	1.45E+05		na
Carbon Disulfide	NA	7.30E+02		na	¥	3.11E+04		na
Acetonitrile	2.39E-04	6.20E+01	3.85E-06	2	2.03E-01	1.01E+05	2.01E-06	2
3-Chloropropene	Ä	1.04E+00		na	NA	9.39E+03		Ba
Methylene Chloride	9.91E-04	4.09E+00	2.42E-04	2	4.92E-01	6.96E+05	7.06E-07	2
tert-Butyl Alcohol	NA NA	NV		na	NA	4.55E+05		na
Acrylonitrile	3.60E-05	2.83E-02	1.27E-03	ou	1.79E-02	2.17E+04	8.23E-07	2
trans-1,2-Dichloroethene	AA A	7.30E+01		na	NA	4.95E+04		ā
Methyl t-Butyl Ether	AN A	3.13E+03		na	NA	4.32E+05		na
Hexane	3.12E-03	2.09E+02	1.50E-05	no	2.65E+00	5.28E+05	5.02E-06	2
1,1-Dichloroethane	۸A	5.21E+02		na	NA	1.21E+06		na
Vinyl Acetate	NA A	2.09E+02		na	NA	1.92E+04		na
cis-1,2-Dichloroethene	Ϋ́Α	3.65E+01		na	NA A	7.92E+05		ā
2-Butanone	¥N N	1.04E+03		na	NA	8.85E+05		na
Ethyl Acetate	NA NA	3.29E+03		na	NA	1.44E+06		na
Methyl Acrylate	¥	1.10E+02		na	NA	NA		na
Chloroform	AN	8.35E-02		na	NA	9.76E+03		na
1,1,1-Trichloroethane	¥	1.04E+03		na	NA	1.94E+06		na
Carbon Tetrachloride	ΑN	1.28E-01		na	NA	1.28E+05		na
1,2-Dichloroethane	NA	7.39E-02		na	NA	8.08E+03		na
Benzene	1.22E-03	2.49E-01	4.89E-03	ou	6.04E-01	1.56E+05	3.87E-06	2
Isooctane (2,2,4-trimethylpentane)	ΑN	· N		na	NA	3.50E+05		na
Heptane	AN V	N		na	NA	1.80E+06		na
Trichloroethane	AN.	1.04E+03		na	NA	1.94E+06		na
Ethyl Acrylate	NA	1.40E-01		na	NA	6.14E+04		na

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

	÷	Cartrio	lge, 0.50 c DC	0 caliber, Blai DODIC: A559	Cartridge, 0.50 caliber, Blank, M1A1 (M2) DODIC: A559	A1 (M2)		
Compound	. C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
1,2-Dichloropropane	NA	9.89E-02		na	Ϋ́	5 08F+05		2
Methyl Methacrylate	NA	7.30E+02		na	AN	4 09E+05		<u> </u>
Dibromomethane	NA	3.65E+01		na	NA	2 50F+05		5 5
1,4-Dioxane	NA	6.11E-01		na	NA	9.00E+04		2 2
Bromodichloromethane	NA	1.08E-01		na	NA	4,00E+03		0 0
4-Methyl-2-Pentanone	NA	8.34E+01		na	AN	3.07E+05		2 2
Toluene	1.53E-04	4.02E+02	3.82E-07	20	3.26E-02	1.88E+05	1.74E-07	2 2
Octane	Ϋ́	N		па	NA	ΑN		2
trans-1,3-Dichloropropene	ΑΝ	5.17E-02		na	AN	ΑN		2 2
Ethyl Methacrylate	Ϋ́	3.29E+02		na	NA	NA		2 2
1,1,2-1 richioroethane	ΨX	1.20E-01	·	na	ΑN	1.64E+05	·	2 2
letrachioroethene	ΝA	3.31E+00		na	NA	6.78E+05		na
Z-Hexanone	AN.	5.11E+00		na	NA	4.09E+04		na E
Unitionioring	ΑN	8.00E-02		na	NA	6.00E+03		na
i,z-Dibiornoemane	NA.	8.73E-03		na	NA A	1.54E+05		na
Chlorobenzene	¥N.	6.21E+01		na	ΑΝ	1.38E+05		2
1, 1, 2-1 etrachioroethane	¥.	2.60E-01		na	NA	5.15E+04		na E
Ethylbenzene	AN I	1.06E+03		na	NA	5.43E+05		na
IIIQD-Aylette	1.0/E-04	7.30E+02	1.47E-07	ဥ	9.10E-02	6.51E+05	1.40E-07	2
Shrono	NA	7.30E+02		В	NA	6.51E+05		na
Bromoform	I.USE-U4	1.06E+03	9.92E-08	2	2.23E-02	2.13E+05	1.05E-07	2
Cumene	NΑ	1.7 JE+00		2	Ψ	6.20E+03		na
1, 1, 2, 2-Tetrachloroethane	VN	4.02E+02		<u>e</u>	Ϋ́	2.46E+05		na
1 2 3-Trichloropropage	VIV.	3.315-02		na L	Y.	2.06E+04		na
Bromohenzene	X X	8.61E-04		na	ΑΝ	6.03E+04		na
A-Ethylphians	X <14	1.04E+01		па	NA	4.82E+04		na
1 3 5. Trimethylbenzono	¥ × ×	NV SOLUTION		na	ΑΝ	1.25E+05		na
Alpha Methyl Styrono	Y	6.21E+00		па	AN	3.68E+05		па
1 2 4 Trimothylpon-one	¥.	Z.56E+UZ		na	ΑΝ	NA		ВП
1 3. Dichlorohomana	¥ S	6.21E+00		na E	ΑN	1.80E+05		na
1.4-Dichlordenses	Y S	3.29E+00		g E	۸A	3.61E+04		na
ין די בישווטיטטטוגבחוס	Y.	3.06E-01		g	NA	6.61E+05		na

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

		Cartrid	ge, 0.50 c	aliber DIC:	Cartridge, 0.50 caliber, Blank, M1A1 (M2) DODIC: A559	A1 (M2)	a)	
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
Benzyl Chloride	NA	3.96E-02		na	ΑN	5.20E+03		900
1,2-Dichlorobenzene	NA	2.09E+02		na	¥	3.01E+05		2 2
Hexachlorethane	NA	4.80E-01		na	¥	2.90E+04		5 5
1,2,4-Trichlorobenzene	NA	2.08E+02		na	×	3.71F+04		ğ 5
Hexachlorobutadiene	NA	8.73E-02		na	¥	3.21E+04		2 2
Live de contractor								
Medical	00 1111							
wetnane	4.55E-02.	N/		na	3.87E+01	3.30E+06	1.17E-05	2
Ethylene	4.55E-03	N N		na	3.87E+00	4.60E+05	8.40E-06	2
Acetylene	2.44E-03	N/		na	5.19E-01	NA		na
Ethane	NA	N<		na	ΑN	NA		E
Propylene	NA	NV		na	AN	NA		2 2
Propane	NA	NV		na	ΑN	3.78E+06		2 2
Propyne (methyl acetylene)	NA	N		na	ΑN	2.79E+06		E
Isobutane	NA	N<		na	Ϋ́	9.52E+05		2
1-Butene/Isobutylene (115-11-7)	NA	NV		na	ΑN	6.87E+06		E
1,3-Butadiene/butane	YA.	3.74E-03		na	NA	2.20E+04		na
cis-putene	NA.	≥		na	NA	1.72E+04		na
1-Bulyne	NA	N/		na	NA	NA		na
rans-Burene	AA :	NN.		na	AN	1.72E+04		na
z-butyne (crotonylene)	AN	AN.		g	ν Α	NA		na
ווירפוומוש	AN O	AN		g	AN	1.80E+06		na
n-hexane	3.49E-03	2.10E+02	1.66E-05	2	2.96E+00	5.28E+05	5.62E-06	2
SOAC								
n-nitrosodimethylamine	NA NA	1.37E-04		na	ΝΑ	2.50E+03		na
bis(2-chloroethyl)ether	AN	5.82E-03		na	ΑN	5.85E+04		na
bhenol	ΑΝ	2.19E+03		na	NA	3.85E+04		na
z-cnloropnenol	ΔA	1.83E+01		na	NA	5.25E+03		na
1,3-Dichlorobenzene	AN	3.29E+00		na	NA	3.61E+04		na Eu
1,4-dichlorobenzene	AN A	3.06E-01		na	NA	6.61E+05		na
1,2-dichlorobenzene	NA	2.09E+02		na	NA	3.01E+05		na
penzyl alcohol	NA	1.10E+03	Y	na	NA	5.53E+04		na

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

		Cartrid	lge, 0.50 c DO	allber DIC:	Cartridge, 0.50 caliber, Blank, M1A1 (M2) DODIC: A559	A1 (M2)		3,
Compound	C _{chronte} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronlc} /	> 1?	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
bis(2-chloroisopropyl)ether	ΝΑ	1.92E-01		na	ΑN	6.99E+04		2
2-methylphenol	NA	1.83E+02		na	NA	NA		2 2
hexachloroethane	NA	4.80E-01		na	AN	2.90E+04		2 2
n-nitroso-di-n-propylamine	NA	9.61E-04		na	NA A	2.00F+02		2 2
4-methylphenol	NA	1.83E+02		g	NA	NA		2 2
nitrobenzene	NA	2.09E+00		Вã	¥	1.51E+04		2 2
isophorone	ΑΝ	7.08E+00		na	AN	2.83E+04		2 0
2-nitrophenol	NA NA	NV		na	NA	NA		2 2
2,4-dimethylphenol	VA	7.30E+01		na	AN	W		2 2
bis(2-chloroethoxy)methane	NA	N		na	¥	NA		5 0
2,4-dichlorophenol	NA	1.10E+01		БП	×	3.00F+04		2 2
1,2,4-trichlorobenzene	AN	2.08E+02		na	AN	3 71E±04		<u> </u>
naphthalene	3.74E-04	3.13E+00	1.19E-04	2	3.18E-01	7.86E+04	4 04F-06	2 2
4-chloroaniline	NA	1.46E+01		В	NA	3.00E+04		2 2
hexachlorobutadiene	NA	8.62E-02		Вп	AN	3.21F+04		2
4-chloro-3-methylphenol	NA	N		E	NA A	2.00E+04		2 2
2-methylnaphthalene	NA	7.30E+01		na	NA	2.00E+04		2 2
hexachlorocyclopentadiene	NA	7.30E-02		Ba	AN	2 23E±02		<u> </u>
2,4,6-trichtorophenol	NA	1.10E+02		E	NA NA	3.00E+04		2 2
2,4,5-trichlorophenol	NA	3.65E+02		æ	ΑN	3.00E+04		2 2
Z-chloronaphthalene	AN	2.92E+02		na	NA	6.00E+02		2 2
z-mroaniine	AA :	2.09E-01	-	na	NA	AN A		na
Acenaphunylene	WA	λ N		na	NA.	2.00E+02		na
umemyphmarate	NA	3.65E+04		na	AN	1.50E+04		la E
2,6-dinitrotoluene	ΝΑ	3.65E+00		na	ΑN	6.00E+02		2 0
acenaphthene	NA	2.19E+02		na	AN	1.25E+03		2 2
3-nitroaniline	AA	≥		na	AN	NA		2 2
Z,4-dinitrophenol	VA VA	7.30E+00		na	Ą	7.50E+03		E
dibenzoturan	NA NA	1.46E+01		na	ΑN	NA		2
z,4-dinitrotoluene	Ψ.	7.30E+00		na	NA	6.00E+02		na
4-hitrophenoi	Ψ.	2.92E+01		na	ΝΑ	3.00E+04		na
riuolene	NA NA	1.46E+02		na	ΑΝ	7.50E+04		na

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

		Cartrio	ige, 0.50 c. DO	caliber, Blar DODIC: A559	Cartridge, 0.50 caliber, Blank, M1A1 (M2) DODIC: A559	41 (M2)		
Compound	С _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	С _{асиtе} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
4-chlorophenyl-phenylether	۸N	۸N		na	ΑA	ΝΑ		2
diethylphthalate	NA	2.92E+03		na	¥.	1.50E+04		2 2
4-nitroaniline	NA	N		na	¥	9.00E+03		5 2
.4,6-dinitro-2-methylphenol	NA	3.65E-01		na	NA	5.00F+02		2 2
n-nitrosodlphenylamine(1)	NA	1.37E+00		na	NA	AN		2 2
4-bromophenyl-phenylether	AN	N		na	NA	NA		200
hexachlorobenzene	NA	4.18E-03		na	NA	7.50E+01		2 6
pentachlorophenol	NA	5.60E-02		na	WA	1.50E+03		g
phenanthrene	NA	N		na	ΑN	2.00E+03		Da
anthracene	NA A	1.10E+03		na	AN	6.00E+03		9
di-n-butyiphthalate	NA	3.65E+02		na	NA	1.50E+04		2
fluoranthene	NA	1.46E+02		na	AN	3.00E+01		2 6
pyrene	NA	1.10E+02		na	ΑN	1.50E+04		2 6
butylbenzylphthalate	NA	7.30E+02		na	NA N	5.00E+05		2 2
benzo(a)anthracene	NA	2.17E-02		na	NA NA	6.00E+02		2
chrysene	AA	2.17E+00		na	NA	2.00E+02		2 2
3,3-dichlorobenzidine	ΑĀ	1.50E-02		na	ΑN	6.21E+03		2
bis(2-ethylhexyl)phthalate	AN.	4.80E-01		na	¥	1.00E+04		2
di-n-octylphthalate	AA	7.30E+01		na	Ą	1.50E+05		2
benzo(b)fluoranthene	NA	2.17E-02		na	NA	AN A		2
benzo(k)fluoranthene	NA	2.17E-01		na	NA	NA		na
benzo(a)pyrene	Y S	2.17E-03		na	NA	7.50E+03		na
Indeno(1,2,3-cd)pyrene	NA	2.17E-02		na	AN	ΑN		ng
dibenz(a,h)anthracene	ΑΝ	2.17E-03		na	۸A	3.00E+04		na
benzo(g,h,i)perylene	AN.	N		na	NA	3.00E+04		na
TO-13 (PAHs)								
naphthalene	1.66E-04	3 13 1400	5 32E-05	2	1 445 04	7 00 1	100	
acenaphthylene	6.55E-06	N A	0.021-00	2 2	E 67E 02	7.00E+U4	1.80E-06	2
Acenaphthene	7 72F-07	2 10E±02	2 525 00	0 0	0.071-03	2.00E+02	2.79E-05	2
fluorene	2.01E-06	1.46E+02	1.38E-08	2 2	4.74E-03	7.60E+03	5.25E-07	2
phenanthrene	1 72F-08	À	2	2 2	4 46F 00	7.30E+04	Z.Z8E-U8	2
				<u> </u>	1.40E-U3	Z.UUE+U3	7.29E-07	9

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

:		Cartrid	lge, 0.50 c	allber	Cartridge, 0.50 callber, Blank, M1A1 (M2)	A1 (M2)		
Compound	С _{chrente} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 12	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
anthracene	AN	1.10E+03		na	ΥN	6.00E+03		60
fluoranthene	2.20E-06	1.46E+02	1.50E-08	2	1.87E-03	3.00F+01	6 23E-05	2
pyrene	2.09E-06	1.10E+02	1.91E-08	2	1.77E-03	1.50E+04	1.18F-07	2 2
benzo(a)anthracene	ΑN	2.17E-02		E	A.	6.00E+02		2 2
chrysene	NA	2.17E+00		na	WA	2.00E+02		2 2
benzo(b)fluoranthene	NA	2.17E-02		na	NA	NA		2 2
benzo(k)fluoranthene	NA	2.17E-01		na	NA	NA		E
Benzo(e)pyrene	NA	۸N		na	NA	NA		Ba
benzo(a)pyrene	NA	2.17E-03		na	NA	7.50E+03		na
indeno(1,2,3-cd)pyrene	NA	2.17E-02		na	NA	NA		na
dibenz(a,h)anthracene	NA	2.17E-03		na	NA	3.00E+04		na
benzo(g,h,l)perylene	NA	NV		na L	¥	3.00E+04		na
Dioxins and Furans								
2378-Tetrachlorodibenzo-p-dioxin	NA	4.48E-08		g	NA	3.50E+00		na na
12378-Pentachlorodibenzo-p-dioxin	NA	NV		Б	¥Z	2.50E+00		na
123478-Hexachlorodibenzo-p-dioxin	NA	NV		Ē	ΑN	NA		200
123678-Hexachlorodibenzo-p-dioxin	NA	N/		na	ΑΝ	1.50E+01		na
123789-Hexachlorodibenzo-p-dioxin	NA NA	1.48E-06		na	ΑN	ΑN		Ba
1234678-Heptachlorodibenzo-p-dioxin	6.27E-11	NV		na	1.33E-08	AN		na E
Octachlorodibenzo(p)dioxin	1.13E-09	N<		na	9.57E-07	1.50E+02	6.38E-09	2
2378-Tetrachlorodibenzo-p-furan	ΑΝ	N N		na	NA	2.00E+00		na
12378-Pentachlorodibenzo-p-furan	¥N.	NS.	•	Б	NA V	NA		na
23478-Pentachlorodibenzo-o-furan	NA NA	≥		na	NA	7.50E-02		Вa
1234/8-Hexachlorodibenzo-p-furan	AN A	2		na	NA	7.50E+00		БП
123678-Hexachlorodibenzo-p-furan	¥	N		na	NA	2.50E+00		na
123789-Hexachlorodibenzo-p-furan	AN NA	N		na	NA	NA	1	la
234678-Hexachlorodibenzo-p-furan	ΑΝ	N		na	NA	1.50E+00		na
1234678-Heptachlorodibenzo-p-furan	1.20E-11	N		na	2.55E-09	¥		na
1234789-Heptachlorodibenzo-p-furan	NA NA	S		na	NA	NA NA		na
Octachlorodibenzofuran	1.82E-10	NV		na.	1.55E-07	3.00E+02	5.16E-10	2
Energetics								
Nitrobenzene	AN N	2.09E+00		па	N A	1.51E+04		па

Table D-3: Comparison of Modeled Air Concentrations with Health-Based Values - 200 meter location

		Cartrid	ge, 0.50 c	0 caliber, Blar DODIC: A559	Cartridge, 0.50 caliber, Blank, M1A1 (M2) DODIC: A559	11 (M2)		
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (ug/m³)	C _{chrontc} / HBSL	× 12	Cacute (µg/m³)	Acute Toxicity Value	Cacute/ ATV	× 12
2-Nitrotoluene	NA A	3.65E+01		E	AN	NA NA		1
3-Nitrotoluene	NA	3.65E+01		na	ΝΑ	ξ.V		<u> </u>
4-Nitrotoluene	NA NA	3.65E+01		na	NA	3.37E+04		2 2
Nitroglycerine	AN .	4.80E-01		na	NA	ΑΝ		e l
1,3-Unillopenzene	¥ S	3.65E-01		na	NA	3.00E+03		na
2.0-Dinitiofullene	AN .	3.65E+00		na	NA A	6.00E+02		na
4.4-Dillillololuene	NA.	7.30E+00		na	NA	6.00E+02		na
1,5,5-1 IIIIII UDBNZENE	NA	1.10E+02		na	AA	3.00E+04		2
Z,4,6-1 finitfotoluene	¥.	2.24E-01		na	NA	2.50E+04		na
KUX	Y Y	6.11E-02		na	NA	NA		na
2. Amino. 2 & Dinitrofoliono	AN A	AN.		na	AN	NA		na
Tetral	\$ \$	NV C		na	ΑΝ	1.50E+04		na
LINAX	XX XX	3.65E+01		na	AA	NA		na
NVIII	¥	1.83E+02		na	NA	NA		na
r en aer yn molten an ir ate	NA NA	NV		na	NA	5.00E+01		2
Dibutyl Phthalate	NA	3.65E+02		na	¥	1.50F+04		5 6
Dioctyl Phthalate	AA	4.80E-01		E	AN	1 00 = +04		5
Diphenylamine	NA	9.13E+01		E	¥Z	3 005+04		<u> </u>
Footnotes:								<u> </u>

NA = Not applicable because compound was not detected

NV = No value available

Cchronic = Chronic time-averaged concentration

HBSL = Chronic health-based screening level

>1? = Is the ratio greater than one?

na = Not available because health-based sceening value is not available or not applicable if compound was not detected

Cacute a average acute concentration

ATV = Acute toxicity value

Table D-4: Comparison of Modeled Air Concentrations with Health-Based Values: Total Petroleum Hydrocarbons - 200 meter location

	Cal	rtridge, 0.50 calib	Cartridge, 0.50 caliber, Blank, M1A1 (M2)	M2)
		Oldon	DODIC: A559	
Compaine	Cchronic	Cehronic	Cchronic	Cehronle
	(mg/m ₃)	(m/brl)	(hg/m³)	(hg/m³)
	Aliphatic:C<=8	Aliphatic:C>8	Aromatic:C<=8	Aromatic:C>8
Hexane	3.12E-03	NA	NA	NA
Benzene	NA	NA	2.84E-03	NA
Toluene	NA	NA	1.53E-04	AN
m&p-Xylene	NA	NA	1.07E-04	NA
Styrene	NA	NA	NA	1.05E-04
n-Hexane	3.49E-03	NA	NA	NA
naphthalene	NA	NA	NA	3.74E-04
naphthalene	NA	NA	NA	1.66E-04
acenaphthylene	NA	NA	NA	6.55E-06
Acenaphthene	NA	NA	AN	7.72E-07
fluorene	NA	NA	NA	2.01E-06
phenanthrene	NA	NA	AN	1.72E-06
fluoranthene	NA	NA	AN	2.20E-06
Total (µg/m³)	6.61E-03	0.00E+00	3.10E-03	6.58E-04
Derived Health-Based Screening Level	1.92E+04	1.04E+03	4.17E+02	2.09E+02
C _{chronic} /HBSL	3.44E-07	0.00E+00	7.43E-06	3.16E-06
>1?	ou	ou	ou	ou
Footnotes:				
>17 = Is the ratio greater than one?				
INA = Not Applicable because compound was not detected				
Cehronic = CITONIC averaged air Concentration				
HBSL = Health-Based Screening Level				

APPENDIX E

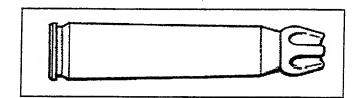
FACT SHEET SUBMITTED TO THE U.S. ARMY ENVIRONMENTAL CENTER

U.S. Army Environmental CenterTraining Munitions Fact Sheet

M1A1 .50 Caliber Blank Cartridge

Department of Defense Identification Code: A559

Breathing air emissions from the M1A1 .50 caliber blank cartridge will not impact the health of residents who live as close as 200 meters (656 feet) from the firing location.



To be fully prepared to protect our country, U.S. soldiers must train with many different weapons and munitions, including the M1A1 .50 caliber blank cartridge. This training is important because it helps prepare our soldiers for a variety of combat situations. While the Army recognizes the value of such comprehensive training on our installations, we also work hard to ensure the safety and health of surrounding communities.

WILL BREATHING AIR EMISSIONS FROM THE M1A1 .50 CALIBER BLANK CARTRIDGE AFFECT MY HEALTH?

To answer this question, the U.S. Army tested the air emissions that are released when the M1A1 is fired. The information gathered during these tests was then analyzed to determine if there would be a potential for health effects from inhalation to residents who live near training areas. Study results, generated using conservative methods, showed that offsite residents breathing air as close as 200 meters (656 feet or about the length of two football fields) from the firing location are safe from these emissions. If offsite residents are located less than 200 meters from the firing locations, a more site-specific evaluation would be necessary. It should be noted that at most locations, training areas are at least 1,000 meters (over half a mile) away from populated areas and the distance to firing locations may be even farther.

How Was The Study Conducted?

To gather data for this study, the M1A1 was fired from the M2 machine gun in a test chamber. The air in the chamber was then tested to identify the types and amounts of substances released. About 300 different substances were looked for during this part of the study.

This information was then used in an U.S. Environmental Protection Agency (USEPA) approved air model (a computer program that allows estimation of air concentrations) to determine the amount of each substance to which someone

living near a training site might be exposed. Downwind concentrations were estimated based on a typical use scenario for the M1A1 during training exercises. Since this study did not look at any one specific training area, the assumptions used in the model would, in most cases, predict higher downwind air concentrations than those expected at an actual training site.

These estimated air concentrations were then compared to screening levels established by the USEPA and other federal agencies. If the air concentrations are less than these screening levels, they are considered safe for the general population, including sensitive people such as the sick, elderly, and children.

WHAT ARE THE STUDY LIMITATIONS?

Many steps were taken to ensure that the results of this study are protective of residents who live near training facilities. However, as with any study, this study has limitations. For example, the study does not consider exposure to other types of munitions that could also be used during the same training event. Due to these limitations, conservative model conditions were used to ensure the protection of public health from breathing M1A1 air emissions.

WHAT EXACTLY IS THE M1A1 .50 CALIBER BLANK CARTRIDGE?

The M1A1 is a blank cartridge used only in training. It has no projectile and is used to simulate firing in training exercises. To use the M1A1, a device is attached to the weapon allowing for firing of blank ammunition. The M1A1 consists of a brass cartridge case and contains a propelling charge made up primarily of nitrocellulose and nitroglycerine. Nitrocellulose is commonly used in furniture lacquers, printing inks, nail polish, and as a primary ingredient in smokeless propellants for military and commercial use. Nitroglycerin is a component of dynamite and is used for military and industrial purposes such as mining and demolition. The M1A1 cartridge can be identified by the rosette crimp at the mouth and absence of a bullet.

WHERE CAN I GET MORE INFORMATION?

For more information on the M1A1 or other military munitions, please call the Army Environmental Hotline at 1-800-USA-3845, visit our Web site at www.aec.army.mil, or e-mail t2hotline@aec.apgea.army.mil.